

OVERVIEW AND EXAMPLES OF THE EDITOR SYSTEM
FOR PROCESSING LANDSAT DATA

New Techniques Section
Research and Development Branch
Statistical Reporting Service
United States Department of Agriculture
Washington, D.C.

March 1977

OVERVIEW AND EXAMPLES OF THE EDITOR SYSTEM
FOR PROCESSING LANDSAT DATA

by

ROBERT R. STARBUCK

New Techniques Section
Research and Development Branch
Statistical Reporting Service
United States Department of Agriculture
Washington, D.C.

March 1977

TABLE OF CONTENTS

	Page
PURPOSE.....	iii
INTRODUCTION.....	iii
EDITOR SUBSYSTEMS.....	iii
EXAMPLES.....	1
Registration and Digitization Subsystems	
EDIT AND EVALUATE CONTROL POINT FILE.....	1
DIGITIZE A SEGMENT.....	5
COMPUTE SEGMENT WINDOWS.....	7
PLOT SEGMENT INFORMATION.....	8
OVERLAY OF SEGMENT PLOT ON GREYSCALE.....	9
SHIFTING SEGMENTS USING DIGITIZER.....	10
GENERATE REDIRECT FILE TO SHIFT SEGMENTS.....	11
CALIBRATE SEGMENTS LOCALLY.....	12
Segment Location and Masking Subsystems	
ARCHIVE SEGMENT DATA.....	13
RETRIEVE SEGMENTS FROM TAPE.....	15
GENERATE MASK FILE.....	16
RETRIEVE WINDOW FROM TAPE.....	17
IDENTIFY A WINDOW.....	18
SPECIFY WINDOWS BY DIGITIZING MAPS.....	19
CLIP A WINDOW.....	20
Data Analysis Subsystems	
EDIT A SEGMENT CATALOG.....	22
PACK A FILE.....	23
IDENTIFY A PACKED FILE.....	25
SAMPLE FIELDS.....	26
TABULATE A PACKED FILE.....	28
SCATTERGRAM OF A WINDOW.....	29
PRINT A WINDOW - RAW WINDOW.....	31
PRINT A WINDOW - FIELD BOUNDARIES.....	32
TRANSFORM DATA USING PRINCIPAL COMPONENTS.....	33
MODIFY A WINDOW HEADER.....	34
CLUSTER A WINDOW.....	35
FTP.....	37
EXECUTE ANALYSIS ON ILLIAC IV.....	38
GROUP CATEGORIES AUTOMATICALLY.....	40
ENTER STATISTICS FILE EDITOR.....	43
GENERATE CONCENTRATION ELLIPSES.....	47
CLASSIFY A WINDOW.....	49
COUNT CATEGORIZED PIXELS.....	50
UNPACK A FILE.....	51
PRINT A WINDOW - CATEGORIZED OR CLASSIFIED FILE.....	52
TABULATE THRESHOLDED PIXELS.....	53
TABULATE A CLASSIFIED FILE.....	54
DETERMINE PERCENT CORRECT.....	55

Contents

	Page
Acreage Estimation Subsystems	
REVISE AND LIST A FRAME UNIT FILE.....	56
TESTING COUNTIES FOR COMPLETE CONTAINMENT IN A SCENE.....	57
ESTIMATE ACREAGE - DIRECT EXPANSION.....	58
ESTIMATE ACREAGE - REGRESSION.....	61
PROCESS SEGMENT TOTAL FILES.....	64
ADD AGGREGATION FILES.....	67
DISPLAY AGGREGATION FILES.....	68
ESTIMATE ACREAGE - LARGE SCALE ESTIMATION.....	69
 BIBLIOGRAPHY.....	 71
 APPENDIX.....	 73

PURPOSE

The purpose of this paper is to present an overview of the EDITOR system for processing LANDSAT data and to present examples of some of the steps performed in an analysis of LANDSAT data.

INTRODUCTION

The following describes the processing functions of EDITOR, a software system for processing LANDSAT data developed by the Center for Advanced Computation of the University of Illinois. Basically, the systems can be broken down into the following functional subsystems:

1. Registration and digitization subsystems.
2. Segment location and masking subsystems.
3. Data analysis subsystems.
4. Acreage estimation subsystems.

EDITOR SUBSYSTEMS

A. Registration and Digitization

For supervised training of a classifier it is necessary to train the classifier with labeled pixels, i.e. pixels of known cover type. To do this, first one digitizes ground-truth sample segments and then registers these segments to the LANDSAT data. The output of digitizing a segment is referred to as a segment network file. The segment registration process is a two-step process consisting of first computing a global calibration file and then shifting the segments locally to

obtain maximum visual correlation of the ground data with the LANDSAT greyscale.

The global scene-calibration process, done with the 'EDIT AND EVALUATE POINT FILE' command (p.1), computes a bivariate polynomial transformation between (latitude,longitude) and (line,column). The coefficients of this bivariate transformation are stored in the global calibration file. A convention used for naming this file is 'scene-ID.CAL'; e.g. file 2175-15592.CAL is the global calibration file for scene 2175-15592. An intermediate file of corresponding points is created prior to outputting the global calibration file. The corresponding-points file contains the (row,column) coordinates and the (latitude,longitude) coordinates of points common to both the LANDSAT imagery and the topographic quadrangle maps. Once the global calibration file for a scene has been created, segments are digitized using the 'DIGITIZE A SEGMENT' command (p.5), plotted at the scale of the LANDSAT greyscales using the 'PLOT SEGMENT INFORMATION' command (p.8), and then shifted from the location predicted by the global calibration file to the final location in the LANDSAT data. The final location for a segment is where maximum visual correlation is obtained between ground truth and the LANDSAT greyscale. The local shifting of segments is done with the commands on pages 10-12.

B. Segment Location and Masking Subsystems

After the segments are locally registered (or calibrated), the segment windows are pulled from tape by the 'RETRIEVE WINDOW FROM TAPE' command (p.17) using a file of window coordinates as input. This file is generated by the 'COMPUTE SEGMENT WINDOWS' command (p.7) or the 'SAVE

MASK WINDOWS IN A FILE' option of the 'GENERATE MASK FILE' command (p.16). After the masks are generated the segment network files may be deleted if they had been pulled from tape with the 'RETRIEVE SEGMENTS FROM TAPE' command (p.15) or may be archived with either the EXEC level 'ARCHIVE FILE' command or with the 'ARCHIVE SEGMENT DATA' command (p.13), which creates a new ground-data archive tape.

The mask file generated with the 'GENERATE MASK FILE' results from registering a segment to a frame of MSS data and is a mask assigning the pixels to the various fields in the segment. The default file name assigned by the system is of the form segment-number.MASK/frame-ID. For example file 5001.MASK/2175-15592 is the mask for segment 5001 and is registered to the LANDSAT data with global calibration file 2175-15592.CAL. The local calibration file for the segment is also used in the mask generation; its default name for the previous example would be file 5001.CAL/2175-15592. The segment windows of MSS data are stored conveniently in a file called a multi-window file, which can be identified with the 'IDENTIFY A WINDOW' command (p.18).

To obtain raw data windows relative to a map, one uses the 'SPECIFY WINDOWS BY DIGITIZING MAPS' command (p.19). A map is placed on a digitizer tablet and the desired windows are selected. The window coordinates are output to a window coordinates file. The raw data file is then created using the 'RETRIEVE WINDOW FROM TAPE' command (p.17). The 'CLIP A WINDOW' command (p.20) may then be used to select areas within these windows, if desired, and to merge multi-window files.

C. Data Analysis Subsystems

If one wishes to process only segments in a certain county, LANDSAT frame, or group of counties, a file called the segment catalog file is created which lists attributes of the segments. This file is created with the 'EDIT A SEGMENT CATALOG' command (p.22). The default name supplied by EDITOR for this file is State-name.Catlg, e.g. ILLINOIS.CATLG.

To train a classifier with only one cover type the 'PACK A FILE' command is used (p.23). This packing process uses the ground-truth file to specify the crop type, the mask file for the determination of which pixels are in which fields, and the segment catalog to specify which set of segments are to be processed. The set of segments to pack is conveniently specified with a boolean-like language and is explained in more detail in [11]. The 'IDENTIFY A PACKED FILE' command (p.25) outputs the pixels specified by 'SELECT OPTIONS', i.e. the cover or covers to be packed into the packed file and/or the set of segments in which pixels to be packed are located. One can also pack just a specific set of fields that have been sampled by the 'SAMPLE FIELDS' command (p.26) according to a user-supplied statistical criterion. More details of this command are also given in [11].

Once a packed file has been classified, it is convenient to know how many pixels were classified into a particular category in each segment. This is done with the 'TABULATE A PACKED FILE' command (p.28). The tabulated packed file can be used to determine the percent correct categorization of a classifier.

Greyscales of raw window files are printed using the 'PRINT A WINDOW' command (p.31). This command is also used to print field boundaries (p.32) and to display categorized or classified files (p.52). A scattergram of a raw or categorized window file may be displayed for two channels using the 'SCATTERGRAM OF A WINDOW' command (p.29).

Principal components analyses may be performed using the 'TRANSFORM DATA USING PRINCIPAL COMPONENTS' command (p.33). As an option a transformed raw data file may be created, which may be unpacked for display purposes and for repacking by cover type (p.23).

To perform a cluster analysis on a packed file, the file header must be modified by the 'MODIFY A WINDOW HEADER' command (p.34), in which the user specifies the initial number of clusters and the separability threshold for clustering on TENEX (the separability threshold is not used for ILLIAC IV clustering). The 'CLUSTER A WINDOW' command (p.35) is then used to cluster the packed file into clusters, starting with the number of clusters specified in 'MODIFY A WINDOW HEADER' and combining clusters using the separability threshold until the user-specified minimum number of categories is attained, or a specified number of iterations is reached. Optional output includes a categorized window file and a statistics file. An alternative method of combining clusters is available with the 'GROUP CATEGORIES AUTOMATICALLY' command (p.40). This is a heirarchical cluster analysis procedure which uses a pattern transmission loss function as a criterion to merge clusters.

To perform analyses on other systems or at other sites, it is necessary to be able to transfer files to those sites, which can be

accomplished by the EXEC level 'FTP' command (p.37). To obtain access to host computers via the ARPA network, the user uses the EXEC level 'TELNET' command (p.37), which provides the user with the capability to communicate with a remote computer as if he were using an interactive terminal at the remote site.

Analyses of large data sets may be performed on the ILLIAC IV in Sunnyvale, California using the 'EXECUTE ANALYSIS ON ILLIAC IV' command (p.38).

Editing statistics files created by the clustering program is done using the 'ENTER STATISTICS FILE EDITOR' command (p.43). This may be used to display statistics, merge statistics files, pool categories, invert the covariance matrix, enter prior probabilities, create new statistics files, and perform other editing functions.

Plot files for 2-band concentration ellipses may be created using the 'GENERATE CONCENTRATION ELLIPSE PLOTS' command (p.47). The resulting plot files can then be inputted into the EXEC-level 'DRIVER' command.

A raw window file may be classified using the 'CLASSIFY A WINDOW' command (p.49). An input statistics file is used to develop the discriminant functions and the results of the classification are output to a classified file. A count of the number of pixels in each category of a categorized or classified file can be obtained using the 'COUNT CATEGORIZED PIXELS' command (p.50).

To unpack a packed file one may use the 'UNPACK A FILE' command (p.51) under SELECT FIELDS TO EXTRACT. This must be done prior to using the 'PRINT A WINDOW' command (p.52) to display a classified file.

To obtain a count of the number of pixels at a given threshold level and the number of pixels at or below a given threshold level, one may use the 'TABULATE THRESHOLDED PIXELS' command (p.53). This gives an indication of how many pixels will be discarded in the process of tabulating a classified file, which is done using the 'TABULATE A CLASSIFIED FILE' command (p.54). The tabulation process counts the number of pixels at or above a given threshold level by category and either by segment or for all segments combined. To determine the correct-classification percentage, one uses the 'DETERMINE PERCENT CORRECT' command (p.55).

D. Acreage Estimation Subsystems

Before acreage estimation can take place, one must create a frame unit file, which contains strata numbers, total number of sample units within a county, and the frame unit sizes. This is done with the 'REVISE AND LIST A FRAME UNIT FILE' command (p.56). Prior to county estimation one needs to verify that the county under study is entirely contained in the LANDSAT scene. This process is displayed on page 57.

Acreage estimates are obtained using the 'ESTIMATE ACREAGE' command (pp.57,58,69). For the 'SAMPLE ESTIMATION' regression estimator option (p.61), an optional estimator output file may be created for use in the 'LARGE SCALE ESTIMATION' option (p.69). An output file of total pixels and digitized and reported acres may also be created; the 'PROCESS SEGMENT TOTAL FILES' command (p.64) may then be used on this file to perform a linear regression analysis, test hypotheses, print scattergrams, etc. The LARGE SCALE option produces county estimates and requires both the estimator parameter file mentioned above and county

aggregation files created by the 'CLASSIFY AND AGGREGATE' subcommand of 'EXECUTE ANALYSIS ON ILLIAC IV' (p.38). A county aggregation file is outputted by the ILLIAC IV classification of one or more LANDSAT scenes and contains the number of pixels in each county stratum that have been classified into each category. The 'ADD AGGREGATION FILES' command (p.67) adds aggregation files for counties and the 'DISPLAY AGGREGATION FILES' command (p.68) prints out the number of pixels in each category by stratum.

EDITING A CORRESPONDING POINTS FILE AND
CREATING GLOBAL CALIBRATION FILE

@<RAY>EDITOR
!ACCESS GEOGRAPHIC REGISTRATION PROCEDURES
2!EDIT AND EVALUATE CONTROL POINT FILE

<R...READ OLD FILE OF CPS AND ADD THEM TO CURRENT LIST
OLD CORRESPONDING POINTS INPUT FILE=2228-15515.CP
37 PAIRS REMAIN OUT OF 37 OR 100.0%

Note: do this only if a cp file already exists

<A...ADD CP PAIRS
SOURCE OF MAP COORDS? (? FOR LIST) DM
DIGITIZER TYPE? (? FOR LIST) USDA
MARK MEANS DIGITIZE A POINT ON TABLET.
PLACE MAP ON TABLET, NORTH AT TOP.
MARK FOUR CORNERS OF MAP CLOCKWISE FROM LOWER RIGHT.
mark corners
MARK LOWER RIGHT NOW. mark
MARK LOWER LEFT NOW. mark
MARK UPPER LEFT NOW. mark
MARK UPPER RIGHT NOW. mark
ENTER DEGREE COORDINATES OF LOWER RIGHT AND UPPER LEFT CORNERS
(LAT LON LAT LON ^EACH AS D M^):38 22.5 89 30 38 30 89 37.5
SOURCE OF IMAGE COORDS? (? FOR LIST) T
ARE IMAGE COORDS OBLIQUELY TRANSFORMED? (Y OR N) Y
IMAGE CALIBRATION INPUT FILE=2228-15515.CAL

Note: this file was created earlier using the corresponding points
in the file 2228-15515.CP and the '<AN' subcommand. An
example of how to do this appears further on.

POINT 38...MARK MAP. mark
IMAGE ROW COL? 1816 240
POINT 39...MARK MAP. mark 'QUIT'
CONTINUE USING THIS MAP? (Y OR N) N
ANOTHER MAP? (Y OR N) N

<AN..ANALYZE VIA LEAST SQUARES
USE A GENERAL POLYNOMIAL? (Y OR N) Y
DEGREE? (0-4) 2
ROOT MEAN SQUARE ERRORS ARE: 0.6398 2.0627
MAX ABS ERRORS ARE: 1.8865 3.7120
AND OCCUR FOR CPS 5 28
<<Q...QUIT

<A
POINT 39...PLACE MAP ON TABLET, NORTH AT TOP.
MARK FOUR CORNERS OF MAP CLOCKWISE FROM LOWER RIGHT.
MARK LOWER RIGHT NOW. mark
MARK LOWER LEFT NOW. mark
MARK UPPER LEFT NOW. mark
MARK UPPER RIGHT NOW. mark

ENTER DEGREE COORDINATES OF LOWER RIGHT AND UPPER LEFT CORNERS
(LAT LON LAT LON ^EACH AS D M^): 38 15 88 07.5 38 22.5 88 15
MARK MAP. mark (point 39)
IMAGE ROW COL? 1987.5 2207
POINT 40...MARK MAP. mark 'QUIT'
CONTINUE USING THIS MAP? (Y OR N) N
ANOTHER MAP? (Y OR N) Y
PLACE MAP ON TABLET, NORTH AT TOP

see above

<CI..CHANGE IMAGE COORDS ONLY
RANGE? (L,H) 42
POINT 42...IMAGE ROW COL? 1439.5 1710.5

<C...CHANGE CPS
RANGE? (L,H) 47
POINT 47...PLACE MAP ON TABLET, NORTH AT TOP.

see above

<AN
ROOT MEAN SQUARE ERRORS ARE: 0.5403 2.0081
MAX ABS ERRORS ARE: 2.0923 4.6789
AND OCCUR FOR CPS 5 28

<<SA..SORT ALL CPS BY LSQ POLYNOMIAL

PAIR	ROW	COL	RERROR	CERROR
28	2061.8	3110.1	0.40	4.68
38	1875.6	17.7	0.11	-4.23

.
.
.

64 149.9 808.5 -0.08 0.01

<<A...AUTO DELETE UNTIL LSQ ERROR <= A VALUE
MAXIMUM ABSOLUTE ACCEPTABLE ERROR? (>0.0) 3.0
CPS DELETED... 28 13 15 38 49 36 4
MAXIMUM ERROR IS NOW 2.6178 FOR CP 3

7 PAIRS DELETED, 57 OR 89.1% LEFT.

<<SA

PAIR	ROW	COL	RERROR	CERROR
D 38	1875.6	17.7	0.45	-8.33

.
.
.

D 13	243.6	3031.3	0.43	4.05
3	1519.6	340.2	0.32	-2.62

.
.
.

12 136.5 2774.7 -0.13 -0.09

<<Q

<AN
ROOT MEAN SQUARE ERRORS ARE: 0.5566 1.3348
MAX ABS ERRORS ARE: 1.9644 2.6178
AND OCCUR FOR CPS 5 3
<<A
MAXIMUM ABSOLUTE ACCEPTABLE ERROR? (>0.0) 2.5
CPS DELETED... 3 55 35 62
MAXIMUM ERROR IS NOW 2.1729 FOR CP 61

4 PAIRS DELETED, 53 OR 82.8% LEFT.

<<SA
see printout above for format

<<P...PRINT LSQ POLYNOMIAL COEFFICIENTS
POLYNOMIAL IS...

1065.799 -1029.695 P +199.279 Q +2.130194 P2 -3.573057 PQ -5.016435 Q2
1963.049 -377.3374 P -1357.208 Q +.9363384 P2 +16.05988 PQ +2.579666 Q2

<<Q

<U...UNDELETE CPS
RANGE? (L,H) 1,64
12 PAIRS UNDELETED, 64 PAIRS REMAIN OUT OF 64 OR 100.0%

<AN
ROOT MEAN SQUARE ERRORS ARE: 0.5403 2.0081
MAX ABS ERRORS ARE: 2.0923 4.6789
AND OCCUR FOR CPS 5 28
<<Q

<D...DELETE CPS
RANGE? (L,H) 28
1 PAIRS DELETED, 63 PAIRS REMAIN OUT OF 64 OR 98.4%

<AN
ROOT MEAN SQUARE ERRORS ARE: 0.5413 1.8832
MAX ABS ERRORS ARE: 2.0325 4.2603
AND OCCUR FOR CPS 5 13
<<Q

D
RANGE? (L,H) 13
1 PAIRS DELETED, 62 PAIRS REMAIN OUT OF 64 OR 96.9%

<AN

<AN
ROOT MEAN SQUARE ERRORS ARE: 0.5614 1.3307
MAX ABS ERRORS ARE: 1.9491 2.5675
AND OCCUR FOR CPS 5 3

<<SA
see printout above for format

```

<<O...OUTPUT POLY TO IMAGE CALIBRATION FILE
OLD IMAGE CALIBRATION INPUT FILE=2228-15515.CAL
  [Old version]
IMAGE CALIBRATION OUTPUT FILE=2228-15515.PCAL
  [New file]
EVALUATING INVERSE
ROOT MEAN SQUARE ERRORS ARE:      0.0003      0.0007
MAX ABS ERRORS ARE:      0.0006      0.0016
AND OCCUR FOR CPS      8      35
<<Q

```

Note: one needs to create a first-degree polynomial in <AN and output the polynomial with <<O before higher degree polynomials can be output.

```

<L...LIST CPS
RANGE? (L,H) 1,62
UNDELETED CPS...
PAIR      LAT      LON      ROW      COL      RERROR  CERROR
  1   41  5.9424  89 55.5504  322.4  164.4  -0.42  -2.30
  2   40  6.5298  89  5.7834 1491.6 1849.0  -0.50  -1.77
  .
  .
  .
62   39 41.2560  89 39.2640 2185.5 1247.7  -0.46   0.68

```

```

<W...WRITE UNDELETED CPS TO A FILE
62 UNDELETED POINTS WILL BE OUTPUT.
OK? (Y OR N) Y
NEW CORRESPONDING POINTS OUTPUT FILE=2228-15515.PCP
  [New file]

```

```

<Q
2!

```

GLOBAL CALIBRATION FILE

@TYPE 2228-15515.PCAL

```

181,77,2228,-15515
-1350.66,219.6205,36105.33,0
-504.9881,-1454.258,151684.7,0
6,0,0,0
-1.075106,.000931874,-1.378566,.0007598156
-1.075106,.000931874,-1.378566,.0007598156
40.34885,-.7502247,-.137463,.002297791
.001083803,-.00259224,0,0
89.03809,.2597236,-.8617936,-.002326096
.007994575,.004388985,0,0
40.34885,-.7502247,-.137463,.002297791
.001083803,-.00259224,0,0
89.03809,.2597236,-.8617936,-.002326096
.007994575,.004388985,0,0

```

DIGITIZE A SEGMENT

@<RAY>EDITOR

!USE GROUND DATA EDITING SYSTEMS

2!DIGITIZE A SEGMENT

#C...CALIBRATE SEGMENT

DIGITIZER TYPE? (? FOR LIST) USDA

MARK MEANS DIGITIZE A POINT ON THE TABLET.

PLACE SEGMENT ON TABLET, DIGITIZE CAREFULLY.

MARK FOUR CORNERS ON SEGMENT CLOCKWISE FROM LOWER RIGHT.

MARK LOWER RIGHT NOW. mark

MARK LOWER LEFT NOW. mark

MARK UPPER LEFT NOW. mark

MARK UPPER RIGHT NOW. mark

SEGMENT CALIBRATION.

ARE SEGMENT CPS LOCATED AT CORNERS OR AT RANDOM? (C OR R) R

ARE MAP CPS RANDOM OR FROM TERMINAL OR FILE? (R, T, OR F) R

PLACE MAP ON TABLET, NORTH AT TOP.

MARK FOUR CORNERS OF MAP CLOCKWISE FROM LOWER RIGHT.

MARK LOWER RIGHT NOW. mark

MARK LOWER LEFT NOW. mark

MARK UPPER LEFT NOW. mark

MARK UPPER RIGHT NOW. mark

ENTER DEGREE COORDINATES OF LOWER RIGHT AND UPPER LEFT CORNERS

(LAT LON LAT LON ^EACH AS D M^):39 50 95 45 39 52.5 95 47.5

MARK MAP. mark

MARK SEGMENT. mark

MARK MAP. mark

MARK SEGMENT. mark

.
. .
.

MARK MAP. mark 'QUIT'

ANOTHER MAP? (Y OR N) N ('Y' if segment is on more than one quad map)

(MAX ERRORS WERE X: .0048, Y: .0049 INCHES.)

ACCEPT? (Y OR N) Y (if 'N' redo marking map and segment)

SEGMENT SCALE IS 1: 7909

(ONE INCH TO 0.12 MILES.)

IS SCALE REASONABLE? (Y OR N) Y

#D...DIGITIZE SEGMENT

DIGITIZE FIELDS - USE MENU FOR COMMANDS NOW.

Note: MENU is an area on digitizer tablet with the following commands:

1. SET TRACT & FIELD
2. CLOSE FIELD
3. NEXT FIELD
4. NEXT TRACT
5. NEXT FIELD PART
6. AUTO DIGITIZE
7. DELETE FIELD
8. QUIT

mark field boundaries in clockwise manner. the last point digitized should be the same as the first point digitized.

START...A1:NNNNN 6 VERTICES DIGITIZED, 40.3 ACRES.

START...A2:NNOOOONN

Unexpected digitizer output -- please type ESC and re-digitize. Thanks.

continue marking NNNNNNNNNN 18 VERTICES DIGITIZED, 21.6 ACRES.

START...A3: NN00ONNN 9 VERTICES DIGITIZED, 8.3 ACRES.

mark 'SET TRACT & FIELD'

START...A4: TRACT & FIELD: B1

START...B1: NNN00ONNNN 11 VERTICES DIGITIZED, 6.3 ACRES.

.
.
.

#CH..CHECK DIGITIZED SEGMENT
NOTHING APPEARS TO BE WRONG.

#V...VIEW FIELD INFORMATION

EVERY FIELD? (Y OR N) Y

SHOW ADJACENT FIELDS? (Y OR N) N

----FIELD A1: 40.3 ACRES. COVER TYPE IS UNKNOWN

----FIELD A2: 21.6 ACRES. COVER TYPE IS UNKNOWN

.
.
.

#W...WRITE NEW SEGMENT FILE PART

SEGMENT OUTPUT FILE=5010.SEG

[New file]

SEGMENT 5010, PART 1 OF 1

10 FIELDS, 76 EDGES, 66 VERTICES.

TOTAL SEGMENT ACREAGE: 238.8 ACRES

SEGMENT SCALE IS 1: 7909

(ONE INCH TO 0.12 MILES.)

#Q...QUIT

2!

COMPUTE SEGMENT WINDOWS

@<RAY>EDITOR
!USE GROUND DATA EDITING SYSTEMS
2!COMPUTE SEGMENT WINDOWS
Global calibration input file is 2228-15515.PCAL
WINDOWS OBLIQUELY TRANSFORMED? (Y OR N) Y
SAVE WINDOWS IN A FILE? (Y OR N) Y
output file is E1-GSCALE.WIN-COORDS
WINDOW BORDER IN PIXELS? (1-100) 20
SELECT REGION? (Y OR N) Y
LIST OF SEGMENTS input file is E1.SEGS

FOUND 30 SEGMENTS IN REGION.

SEGMENT 5010
22 FIELDS, 144 EDGES, 125 VERTICES.
TOTAL SEGMENT ACREAGE: 720.8 ACRES.
SEGMENT SCALE IS 1: 7910
(ONE INCH TO 0.12 MILES.)
WINDOW: 1472 2185 1522 2271

.
.
.

2!

PLOT SEGMENT INFORMATION

@<RAY>EDITOR

!USE GROUND DATA EDITING SYSTEMS

2?PLOT SEGMENT INFORMATION

PLOTTER TYPE? (CAC,USDA) USDA

ENTER ONE LINE OF PLOT IDENTIFICATION BELOW

... E1 SEGMENTS - INITIAL PLOT

Plotter output file is E1.PLOTTER-INITIAL

PLOT IN DIGITIZER, MAP OR ERTS COORDS? (D, M, E, DM, OR DME) E

PLOT FIELD NAMES? (Y OR N) Y

Global calibration input file is 2228-15515.PCAL

USE LOCAL CALIBRATION IF AVAILABLE? (Y OR N) N

IS ERTS DATA OBLIQUELY TRANSFORMED? (Y OR N) Y

LINES PER INCH OF PRINTOUT TO OVERLAY? (6 OR 8) 8

SELECT REGION? (Y OR N) Y

STATE=ILLINOIS

*ctrl-B

INPUT COMMAND FILE=E1.SEGS

Seg(

5010,5027,5044,5060,5061,5062,5078,5095,5112,5124,
5129,5146,5163,5205,5262,5263,5265,5267,5270,5271,
5275,5279,5281,5283,5286,5287,5289,5290,5291,5292)#

ACCEPTED SELECTION

SEGMENT 5010, PART 1 OF 1

10 FIELDS, 76 EDGES, 66 VERTICES.

TOTAL SEGMENT ACREAGE: 238.8 ACRES

SEGMENT SCALE IS 1: 7909

(ONE INCH TO 0.12 MILES.)

SIZE: 8.50 X, 5.31 Y.

E PLOTTED SUCCESSFULLY

.
.
.

2!

SHIFTING SEGMENTS USING DIGITIZER

@<STARBUCK>SHIFT

THIS PROGRAM CALCULATES THE AMOUNT OF SHIFT IN TERMS OF ROW AND COLUMN WHEN A SEGMENT IS SHIFTED.

THE OUTPUT FILE IS E1-SEG.SHIFTS

ENTER SEGMENT NUMBER: 5010

ENTER ROW AND COLUMN NUMBERS FOR UPPER-LEFT AND LOWER-RIGHT GRAY-SCALE CORNERS:

UPPER-LEFT CORNER: 1460,1065
LOWER-RIGHT CORNER: 1486,1098

DIGITIZE FOUR CORNERS OF GRAY-SCALE, STARTING AT UPPER-LEFT CORNER, WORKING CLOCKWISE:

UPPER-LEFT CORNER: press cursor key
UPPER-RIGHT CORNER: press cursor key
LOWER-RIGHT CORNER: press cursor key
LOWER-LEFT CORNER: press cursor key

	RESIDUALS				
	R-SQUARE	UL	UR	LR	LL
ROW	1.000000	-0.001	0.001	-0.001	0.001
COLUMN	1.000000	-0.010	0.010	-0.010	0.010

CALIBRATION POINT DIGITIZATION SATISFACTORY? (Y OR N) Y

ENTER ROW AND COLUMN NUMBERS OF COMPARISON POINT: 1472,1080

SHIFT THE SEGMENT AND DIGITIZE THE COMPARISON POINT: press cursor key

SHIFT (ROW,COLUMN,TOTAL): 0.01 -0.09 0.09

OUTPUT TO FILE? (Y OR N) Y

#SEGMENT (NEW SEGMENT)

ENTER SEGMENT NUMBER: 5027

.
.
.

#QUIT

e

OUTPUT FILE FROM <STARBUCK>SHIFT.SAV

@TYPE E1-SEG.SHIFTS

5010, 0.01, -0.09

.
.
.

GENERATE REDIRECT FILE TO CALIBRATE SEGMENTS
USING OUTPUT FILE FROM <STARBUCK>SHIFT

@<STARBUCK>GRED-SHIFT

Calibration Input File: <USDA-SRS>2228-15515.PCAL

Use Local Calibrations? (Y or N) N

'.SEG' Files in Directory: <USDA-SRS>

Shift Input File:

INPUT FILE: E1-SEG.SHIFTS
220 CHARS

OUTPUT FILE: E1.CALIBRATE-SEGS

OUTPUT FILE FROM <STARBUCK>GRED-SHIFT.SAV

@TYPE E1.CALIBRATE-SEGS

<RAY>EDITOR

USE

CALIBRATE

<USDA-SRS>2228-15515.PCAL

N

Y

N

<USDA-SRS>5010.SEG

0.01,-0.09

<USDA-SRS>5027.SEG

0.08,1.14

.

.

.

ctrl-Z

Q

Q

CALIBRATE SEGMENTS LOCALLY

@<RAY>EDITOR

!USE GROUND DATA EDITING SYSTEMS

2!CALIBRATE SEGMENTS LOCALLY

Global calibration input file is 2228-15515.PCAL

USE LOCAL CALIBRATIONS? (Y OR N) N

IMAGE OBLIQUELY TRANSFORMED? (Y OR N) Y

GENERATE A CP FILE? (Y OR N) N

SEGMENT INPUT FILE=5010.SEG

SEGMENT 5010, PART 1 OF 2

10 FIELDS, 76 EDGES, 66 VERTICES.

TOTAL SEGMENT ACREAGE: 238.8 ACRES.

SEGMENT SCALE IS 1: 7909

(ONE INCH TO 0.12 MILES.)

SHIFT SEGMENT PLOT BY (ROW COL, ? FOR HELP) 0.56 -1.03

LOCAL FIT ERRORS: 0.0011 0.0016 PIXELS

Cal file is <USDA-SRS>5010.CAL/2228-15515;1 3-Jan-77 14:47:35

SEGMENT INPUT FILE=5027.SEG

.
.
.

SEGMENT INPUT FILE=ctrl-Z

2!

ARCHIVE SEGMENT DATA

@<RAY>EDITOR

!USE GROUND DATA EDITING SYSTEMS
2!ARCHIVE SEGMENT DATA

#INITIALIZE (first time tape is used)
INITIALIZING TAPE

TAPE DRIVE=MTA1:
STATE FOR THIS TAPE=ILLINOIS
STATE NAME FOR THIS TAPE IS ILLINOIS

#WRITE

READING TAPE DIRECTORY
TAPE DRIVE=MTA1:
STATE=ILLINOIS

FRAME=2228-15515
FRAME ~~2228-15515~~ NOT IN FRAMES LIST FROM TAPE
DO YOU WISH TO ADD IT TO THE FRAMES LIST? (Y OR N)Y
ENTER TAPE WRITE COMMAND
%SELECT SEGMENTS TO WRITE

SELECT REGION
*FRAME 2228-15515#

ACCEPTED SELECTION
BEGIN WRITING FOR SEGMENT 5010

BEGIN WRITING FOR SEGMENT 5027

.
.
.

BEGIN WRITING FOR SEGMENT 5292
**

Note: to write segment data for another frame, return to 'WRITE'

%QUIT
RE-WRITING TAPD DIRECTORY

#READ

READING TAPE DIRECTORY
TAPE DRIVE=MTA1:
STATE=ILLINOIS

..
READ THE CATALOG? (Y OR N) N

FRAME=2228-15515
ENTER READ COMMAND

%SHOW TAPE UTILIZATION

FILE 1: SEGMENT=5010 FRAME=2228-15515 BLOCKS USED=4

FILE 2: SEGMENT=5027 FRAME=2228-15515 BLOCKS USED=3

.
.
.

FILE 30: SEGMENT=5292 FRAME=2228-15515 BLOCKS USED=2

94 DATA BLOCKS IN ACTIVE USE

0 DATA BLOCKS DEAD

94 TOTAL DATA BLOCKS USED

294 TOTAL BLOCKS USED INCLUDING DIRECTORY

737 INCHES (APPROXIMATE) OF TAPE USED

%PRINT DIRECTORY

DIRECTORY BY:

%ALL

STATE=ILLINOIS

TAPE LAST UPDATED 15-Nov-76 15:57:36

LAST FILE WRITTEN ON TAPE=94

LAST BLOCK WRITTEN=294

FIRST BLOCK OF FRAME LIST=1

FIRST BLOCK OF DIRECTORY=2

LENGTH (IN BLOCKS) OF TAPE DIRECTORY=1

FIRST BLOCK OF CATALOG=3

LENGTH OF CATALOG (IN BLOCKS)=7

DIRECTORY OF FILES ON TAPE:

NUMBER OF ENTRIES=94

1: SEGMENT=5010 FRAME=2228-15515 FIRST BLOCK=201 FILE NUMBER=1

WRITTEN 15-Nov-76 15:36:08

SEG NET FILE=0,4 MASK FILE=0,0 RAW DATA FILE=0,0

GROUND TRUTH FILE=0,0 CALIBRATION FILE=0,0

2: SEGMENT=5027 FRAME=2228-15515 FIRST BLOCK=205 FILE NUMBER=2

WRITTEN 15-Nov-76 15:36:55

SEG NET FILE=0,2 MASK FILE=2,1 RAW DATA FILE=0,0

GROUND TRUTH FILE=0,0 CALIBRATION FILE=0,0

.
.
.

%QUIT

#QUIT

2!

RETRIEVAL OF SEGMENT FILES FROM TAPE

(
@LINK OPERATOR
@;WOULD YOU PLEASE MOUNT TAPE ILLINOIS.SEGMENTS ON
@;A 9-TRACK TAPE DRIVE WITHOUT A RING, PLEASE?
!;ok, set to go on MTAO:
@;FINE, I'LL LINK BACK WHEN DONE...BYE
@BREAK
@ASSIGN MTAO:
@MOUNT MTAO:
@<RAY>EDITOR
!USE GROUND DATA EDITING SYSTEMS
2!ARCHIVE SEGMENT DATA
#READ
TAPE DRIVE=MTAO:
STATE=ILLINOIS
READ CATALOG? (Y OR N) N
FRAME=(FOO)
ENTER READ COMMAND
%SELECT SEGMENTS TO READ
SELECT REGION
*ctrl-B
INPUT COMMAND FILE=E1.SEGS
Seg(
5010,5027,5044,5060,5061,5062,5078,5095,5112,5124,
5129,5146,5163,5205,5262,5263,5265,5267,5270,5271,
5275,5279,5281,5283,5286,5287,5289,5290,5291,5292)#

(
ATTEMPTING TO READ FOR SEGMENT 5010
..
ATTEMPTING TO READ FOR SEGMENT 5027
...
.
.
.

%QUIT
#QUIT
2!ctrl-C
@UNLOAD MTAO:
@DEASSIGN MTAO:

GENERATE MASK FILES

@<RAY>EDITOR

!USE GROUND DATA EDITING SYSTEMS

2!GENERATE MASK FILE

SAVE MASK WINDOWS IN A FILE? (Y OR N) Y

OUTPUT FILE=E1.MASK-WIN

[NEW FILE]

WINDOW BORDER IN PIXELS? (1-100) 1

GLOBAL CALIBRATION INPUT FILE IS 2228-15515.PCAL

USE LOCAL CALIBRATIONS IF AVAILABLE? (Y OR N) Y

IS IMAGE OBLIQUELY TRANSFORMED? (Y OR N) Y

LANDSAT FRAME DATE: 7 SEPT 75

GENERATE BOUNDARY INFO? (Y OR N) Y

SELECT REGION? (Y OR N) Y

LIST OF SEGMENTS INPUT FILE IS E1.SEGS

FOUND 30 SEGMENTS IN REGION.

SEGMENT 5010

30 FIELDS, 157 EDGES, 128 VERTICES.

TOTAL SEGMENT ACREAGE: 655.4 ACRES.

(ONE INCH TO 0.12 MILES.)

USING CAL FILE <USDA-SRS>5010.CAL/2228-15515;1,16-DEC-76 10:03:11

MASK SIZE 800 POINTS, 23 WORDS OF MEMORY

MASK WINDOW: 1460 1065 1486 1098

MASK OUTPUT FILE IS <USDA-SRS>5010.MASK/2228-15515;1,16-DEC-76 16:21:22

.
.
.

2!

RETRIEVE WINDOW FROM TAPE

@LINK OPERATOR
@;WOULD YOU PLEASE MOUNT TAPE 2228-15515 ON
@;A 9-TRACK TAPE DRIVE WITHOUT A RING, PLEASE?
!;ok, set to go on MTA2:
@;FINE, I'LL LINK BACK WHEN DONE...BYE
@BREAK
@ASSIGN MTA2:
@MOUNT MTA2:
@<RAY>EDITOR
!RETRIEVE WINDOW FROM TAPE
2!MOVE TAPE TO SPECIFIC FILE
9 TRACK TAPE DRIVE=MTA2:
[OK]
MOVE TAPE TO FILE#1
WAIT
2!IDENTIFY TAPE FILE
TAPE WINDOW
1,1,2660,3985,10600100
NUMBER OF CHANNELS=4
ASCII HEADER INFORMATION
2228-15515 07SEP75 B-02/17/76, 04:52:40 B-02/17/76, 05:03:29
B-09/29/76, 19:58<!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!>D
2!READ COORDINATES FROM A FILE
INPUT COORDINATE FILE=E1.MASK-WIN

#1460,1065,1486,1098
#2309,1439,2334,1471
#1661,949,1686,981
.
.
.

#1739,681,1752,706
2!WRITE OUT TO WINDOW
9 TRACK TAPE DRIVE=MTA2:
[OK]
OUTPUT DISK FILE=E1-MULTI.WIN
[NEW FILE]
WAIT.....
**.....
2!ctrl-C
@UNLOAD MTA2:
@DEASSIGN MTA2:

IDENTIFY A WINDOW

@<RAY>EDITOR

!IDENTIFY A WINDOW

DISK FILE=E1-MULTI.WIN

[Old version]

FILE TYPE=0, CATEGORIES ASKED=0, CATEGORIES OUTPUT=0

DELTA=0, LONG ROWS=144, NUMBER OF WINDOWS=32

CHANNELS=4, IN USE= 1 2 3 4, ROW COL SAMPLING= 1 1

WINDOWS--N,W,S,E,# OF POINTS:

311,948,323,978,403

371,1259,385,1272,210

399,748,416,768,378

.

.

.

2425,1386,2450,1417,832

TOTAL NUMBER OF POINTS=18307

ASCII HEADER INFORMATION:

2228-15515 07SEP75 B-02/17/76, 04:52:40 B-02/17/76, 05:03:29

B-09/29/76, 19:58:58<D

!

SPECIFY WINDOWS BY DIGITIZING MAPS

@<RAY>EDITOR

!USE GROUND DATA EDITING SYSTEMS

2!SPECIFY WINDOWS BY DIGITIZING MAPS

IMAGE CALIBRATION INPUT FILE=2228-15515.PCAL

MAKE A FILE OF WINDOW COORDINATES? (Y OR N) Y

OUTPUT FILE=E1-WATER.WIN-COORDS

IS IMAGE OBLIQUELY TRANSFORMED? (Y OR N) Y

USING A GRAF-PEN DIGITIZER? (Y OR N) N

place quad map on digitizer tablet and mark 4 corners (clockwise)
with cursor. Enter degree coordinates of lower-right and upper-left
corners

(LAT LON LAT LON ^EACH AS D M^): 39 45 90 30 40 00 90 40

WINDOW 1...MARK MAP

mark upper-left and lower-right corner of area on quad map desired

WINDOW 2...MARK MAP

mark upper-left and lower-right corner of area on quad map desired

.

:

.

WINDOW 14...MARK MAP

place pen over "QUIT" position and press cursor key

ANOTHER MAP? (Y OR N) Y

place quad map on digitizer tablet . . . (see above)

.

:

.

ANOTHER MAP? (Y OR N) N

2!

CLIP A WINDOW

@<RAY>EDITOR
!CLIP A WINDOW
INPUT WINDOW FILE=E1-WATER.WIN
TYPE=0
CATEGORIES IN=0
CATEGORIES OUT=0
ROW SAMPLE=1
COLUMN SAMPLE=1
NUMBER OF CHANNELS=4
CHANNELS IN USE: 1 2 3 4
NUMBER OF WINDOWS=8
USE 'DISPLAY' TO DISPLAY WINDOWS
WINDOW 1 ASSUMED, USE 'SELECT WINDOW' COMMAND TO SELECT ANOTHER
2!COPY ALL COORDINATES
OUTPUT WINDOW 1 COPY INPUT WINDOW 1 COORDINATES=178,1123,190,1136
OUTPUT WINDOW 2 COPY INPUT WINDOW 2 COORDINATES=182,1120,197,1128
.
.
.

OUTPUT WINDOW 8 COPY INPUT WINDOW 8 COORDINATES=1643,1583,1644,1584
2!WRITE
NUMBER OF WINDOWS FROM CURRENT INPUT FILE=8
ADDITIONAL SAMPLING, ROW=1, COLUMN=1
OUTPUT FILE=E12-WATER.WIN
[New file]
2!OPEN A NEW INPUT FILE
INPUT WINDOW FILE=E2-WATER.WIN
see above
2!COPY ALL COORDINATES
see above
2!WRITE
NUMBER OF WINDOWS FROM CURRENT INPUT FILE=5
ADDITIONAL SAMPLING, ROW=1, COLUMN=1
2!QUIT
!

!CLIP A WINDOW
INPUT WINDOW FILE=E12-WATER.WIN
NUMBER OF CHANNELS=4
2!COORDINATES
USING INPUT WINDOW 1
*178,1123,180,1125
*182,1120,184,1121

.
:
.

*1822,489,1825,492
*

2!SELECT WINDOW
WHICH WINDOW:2
2!COORDINATES
see above

2!DISPLAY WINDOWS
NUMBER OF INPUT WINDOWS=13
1: 178,1123,180,1125
2: 182,1120,184,1121

.
:
.

13: 1836,1779,1851,1795

NUMBER OF OUTPUT WINDOWS FROM CURRENT INPUT FILE=17
1: 178,1123,180,1125 FROM INPUT WINDOW 1
2: 182,1120,184,1121 FROM INPUT WINDOW 1

.
:
.

17: 1843,1784,1848,1792 FROM INPUT WINDOW 13

2!WRITE
OUTPUT FILE=E12-UNP.WATER
2!

EDIT A SEGMENT CATALOG

@<RAY>EDITOR
!USE GROUND DATA EDITING SYSTEMS
2!EDIT A SEGMENT CATALOG
*OPEN A CATALOG FILE
STATE=ILLINOIS

#INSERT
SEGMENT=5001
INSERT ENTRY
COUNTY=OGLE
FRAME=2175-15583
STRATA=11
QUAD=
MAP TYPE=
EXPANSION FACTOR=1.0
SEGMENT=5003

.
.
.

SEGMENT=

#UPDATE
SEGMENT=5001
EDIT ENTRY
*FRAME
FRAME=2175-15583 ,2193-15581
*PLACE ENTRY INTO CATALOG
SEGMENT=5024

.
.
.

SEGMENT=

#LIST
LISTING BY
%SEGMENT
SEGMENT=5001

SEGMENT=5001 COUNTY=OGLE FRAME=2175-15583,2193-15581 STRATA=11
EXPANSION FACTOR=1.0

#QUIT
ILLINOIS.CATLG;26 CREATED
2!

PACK A FILE

@<RAY>EDITOR
!USE GROUND DATA EDITING SYSTEMS
2!SELECT FIELDS TO EXTRACT

ENTER FRAME NAMES ONE PER LINE (TERMINATE WITH CARRIAGE RETURN ONLY)

:2228-15515

:2228-15522

:

#COMPLEMENT MULTI-WINDOW PRINT SWITCH
DISPLAY OF WINDOW USED FROM MULTI-WINDOW FILE
#OPEN MULTI-WINDOW FILE

FRAMES ARE:

1: 2228-15515

2: 2228-15522

ENTER NUMBER OF FRAME ASSOCIATED WITH THIS MULTI-WINDOW FILE (1 TO 2) 1

INPUT MULTI-WINDOW FILE=<USDA-SRS>E1-MULTI.WIN;1 [Old version]

MULTI-WINDOW FILE TYPE=0

NUMBER OF WINDOWS=32

#OPEN MULTI-WINDOW FILE

FRAMES ARE:

1: 2228-15515

2: 2228-15522

ENTER NUMBER OF FRAME ASSOCIATED WITH THIS MULTI-WINDOW FILE (1 TO 2) 2

INPUT MULTI-WINDOW FILE=<USDA-SRS>E2-MULTI.WIN;1 [Old version]

MULTI-WINDOW FILE TYPE=0

NUMBER OF WINDOWS=36

#DIRECTORIES (SELECT OTHER DIRECTORIES TO TRY)

ENTER DIRECTORIES

:USDA-SRS

:USDA-SD

:

#PACK A FILE
STATE=ILLINOIS

SELECT REGION

*ctrl-B

INPUT COMMAND FILE=E12.SEGS

Seg(

5010,5027,5044,5060,5061,5062,5078,5095,5112,5124,
5129,5146,5163,5205,5262,5263,5265,5267,5270,5271,
5275,5279,5281,5283,5286,5287,5289,5290,5291,5292,
5009,5011,5012,5026,5028,5029,5045,5046,5059,5063,
5064,5076,5077,5079,5080,5096,5097,5113,5114,5128,
5130,5131,5145,5147,5148,5161,5162,5164,5165,5175,
5185,5215,5224,5240)#

SELECT OPTIONS

*NOT BACKGROUND#

ACCEPTED SELECTION

SEG=5009 WINDOW=1(424,944,449,976)

OUTPUT WINDOW FILE=E12-PACK.NB

USING MULTI-WINDOW FILE=<USDA-SRS>E1-MULTI.WIN;1

SEG 5010 WINDOW=15(1460,1065,1486,1098)

USING MULTI-WINDOW FILE=<USDA-SRS>E2-MULTI.WIN;1

.
.
.

SEGMENT #, MASK GROUND TRUTH, DATE: USER OR MASK, NUMBER OF PARTS, PIXELS)

(5009, MG, 7-Sep-75: M, 1, 588) (5010, MG, 7-Sep-75: M, 1, 578)

.
.
.

TOTAL PIXELS FOUND=29918

#

IDENTIFY A PACKED WINDOW

@<RAY>EDITOR

!USE GROUND DATA EDITING SYSTEMS

2!IDENTIFY A PACKED WINDOW

INPUT FILE=E12-PACK.NB

FILE TYPE=0 (RAW DATA WINDOW)

NUMBER OF PIXELS PACKED=29918

SEGMENTS IN REGION SELECTED FOR WHICH SOME PIXELS WERE FOUND:

5009 5010 5011 5012 . . . 5292

CODE FOR OPTIONS SELECTED:

NOT BACKGROUND

2!

SAMPLE FIELDS

@<RAY>EDITOR
!USE GROUND DATA EDITING SYSTEMS
2!SELECT FIELDS TO EXTRACT

ENTER FRAME NAMES ONE PER LINE (TERMINATE WITH CARRIAGE RETURN ONLY)

:2228-15515

:2228-15522

:

DIRECTORIES (SELECT OTHER DIRECTORIES TO TRY)

ENTER DIRECTORIES

:USDA-SRS

:USDA-SD

:

#SAMPLE FIELDS

MAXIMUM PERCENTAGE DIFFERENCE BETWEEN REPORTED, DIGITIZED ACREAGES=20

ENTER TYPE OF SAMPLING

*?

COMMANDS ARE

RANDOM SAMPLE

SYSTEMATIC SAMPLE

?

*RANDOM SAMPLE

ENTER TYPE OF SELECTION PROBABILITIES

*?

COMMANDS ARE

EQUAL PROBABILITIES

PUD PROPORTIONAL TO UNEXPANDED DIGITIZED ACRES

PUR PROPORTIONAL TO UNEXPANDED REPORTED ACRES

PED PROPORTIONAL TO EXPANDED DIGITIZED ACRES

PER PROPORTIONAL TO EXPANDED REPORTED ACRES

?

*PER

STATE=ILLINOIS

SELECT REGION

*FRAME (2228-15515,2228-15522)#

ACCEPTED SELECTION

SELECT OPTIONS

*-COVER CORN#

ACCEPTED SELECTION

(SEGMENT #, MASK GROUND TRUTH, DATE: USER OR MASK, NUMBER OF PARTS, PIXELS)
(5009, MG, 7-Sep-75: M, 1, 155) (5010, MG, 7-Sep-75: M, 1, 115)

·
·
·

634 FIELDS CHOSEN FOR SAMPLE UNIVERSE FROM A POSSIBLE 729
TOTAL ACREAGE FOR SAMPLING UNIVERSE=2822838.0

SHOW FIELDS REJECTED DUE TO ACREAGE DISCREPANCY?(Y OR N) N

NUMBER OF FIELDS TO BE SAMPLED=150

GENERATED 150 FIELDS IN SAMPLE FROM REQUESTED 150
OUTPUT FILE OF SAMPLED FIELDS=E12-FLDS.-CORN

#

TABULATE A PACKED FILE

@<RAY>EDITOR
!USE GROUND DATA EDITING SYSTEMS
2!SELECT FIELDS TO EXTRACT

ENTER FRAME NAMES ONE PER LINE (TERMINATE WITH CARRIAGE RETURN ONLY)

:2228-15515
:2228-15522
:

#DIRECTORIES (SELECT OTHER DIRECTORIES TO TRY)

:USDA-SRS
:USDA-SD
:

#TABULATE

INPUT WINDOW FILE=E12-PACK.NB;1 [Old version]

WINDOW TYPE=0

WINDOW FROM WINDOW FILE=1,1,1,29918

TABULATE BY:

*ALL

SAVE TABLE RESULTS IN A FILE? (Y OR N) N

TABLE FOR ALL SEGMENTS

	1	*
UNKNOWN	: 68:	68:
ALFALFA	: 667:	667:
CORN	:12074:	12074:

.
.
.

TOTAL :29918:29918:

#

SCATTERGRAM OF A WINDOW

@<RAY>EDITOR
!ANALYZE LANDSAT IMAGERY
2!SCATTERGRAM OF A WINDOW

ENTER "C" TO USE BOTH CATEGORIZED AND RAW DATA FILES
ENTER "R" TO USE A RAW DATA FILE ONLY

#R
INPUT RAW DATA FILE=E12-PACK.-CORN

RAW DATA FILE:
NUMBER OF CHANNELS=4
ROW SAMPLE=1
COLUMN SAMPLE=1
NUMBER OF WINDOWS=1

1,1,1,7957
ENTER "S" TO SEE SCATTERGRAM FOR VALUES LESS THAN OR EQUAL TO 64 ONLY
AND "A" TO SEE ALL VALUES

#A

2 CHANNELS TO BE USED (1 TO 4 FOR EACH) 2,4

CHANNEL 2

```

42+          11
  :          1
  :          122
39+          222
  :
  :          1 1
36+          1112
  :          14
  :          144
33+          221
  :          1 231
  :          1 11
30+          11
  :          1 1 1 11112
  :          2 12
27+          1 1 1 3
  :          121 21 1 111
  :          9D727542 1212
24+          24BPFA979611111
  :          6AIDFILAD858211 1
  :          36KOQ***GCDJ14121
21+          20*****ZME62
  :          23B*****WK832 11
  :          2 3BT*****TPC632
18+          3 18HU*****PUH7
  :          1126B9N****SB8513 1
  :          1116CN*****WUC31 131
15+          33JWOO*Z**SOA6711
  :          163DA38573 1
  :          11 31211
12+          111
  :
  :
  :
9+
  :
  :
6+
  :
  :
3+
  :
  :
0+  +-----+-----+-----+-----+-----+-----+
    0 0 1 1 2 2 3 3
    0 5 0 5 0 5 0 4

```

CHANNEL 4

* INDICATES MORE THAN 35 POINTS
7957 TOTAL POINTS FOUND
MAXIMUM OF 231 POINTS AT ANY ONE CHANNEL PAIR LOCATION
CONTINUE WITH THIS FILE? (Y OR N) N
OTHER FILE(S)? (Y OR N) N
2!

TRANSFORMING DATA BY PRINCIPAL COMPONENTS

@<RAY>EDITOR
!ANALYZE LANDSAT IMAGERY
2!TRANSFORM DATA USING PRINCIPAL COMPONENTS

INPUT RAW DATA FILE=E12-PACK.NB&-ALL

DISPLAY MEAN VALUES (Y OR N) Y

MEAN VALUES: 17.96 19.31 42.91 21.39

DISPLAY THE CHANNEL-CORRELATION MATRIX (Y OR N)? Y

1.00000	0.80230	0.14223	-0.02345
	1.00000	-0.23205	-0.38100
		1.00000	0.96119
			1.00000

DISPLAY EIGENVALUES AND VECTORS OF VARIANCE-COVARIANCE MATRIX(Y OR N)? Y

EIGENVALUES AND (NORMALIZED) EIGENVECTORS:

1: EIGENVALUE=	126.082	EIGENVECTOR=	0.016	-0.119	0.852	0.510
2: EIGENVALUE=	23.469	EIGENVECTOR=	0.522	0.829	0.171	-0.108
3: EIGENVALUE=	1.438	EIGENVECTOR=	0.661	-0.524	0.211	-0.494
4: EIGENVALUE=	1.096	EIGENVECTOR=	0.539	-0.157	-0.448	0.696

TRANSFORM DATA (Y OR N) Y

ENTER "E" TO USE EQUAL VARIANCES (OF 256.0) IN ALL CHANNELS
ENTER "R" FOR VARIANCES IN OTHER CHANNELS THAN THE FIRST TO BE
IN THE SAME RATIO AS THE EIGENVALUES

ENTER "U" FOR USER SUPPLIED RATIOS OF VARIANCES

#E

OUTPUT TRANSFORMED WINDOW FILE=E12-PCPACK.NB&-ALL

2!

MODIFY A WINDOW HEADER

@<RAY>EDITOR
!ANALYZE LANDSAT IMAGERY
2!MODIFY WINDOW HEADER
DISK FILE=E12-PACK.-CORN
3!NUMBER OF CATEGORIES DESIRED
NUMBER OF CLUSTERS=3
3!DELTA OR SEPARABILITY THRESHOLD
DELTA=0.75
3!QUIT
2!

CLUSTER A WINDOW

Note: The window header should be modified prior to clustering
(see MODIFY WINDOW HEADER)

@<RAY>EDITOR
!ANALYZE LANDSAT IMAGERY
2!CLUSTER A WINDOW
NUMBER OF CHANNELS=4

USE AN INPUT STATISTICS FILE TO INITIALIZE MODE CENTERS (Y OR N)? N

INPUT WINDOW FILE=E12-PACK.-CORN
CATEGORIES ASKED= 3, DELTA= 0.75, ROW COL SAMPLING= 1 1
CHANNELS=4, TOTAL NUMBER OF POINTS= 7957

MINIMUM NUMBER OF CATEGORIES AFTER MERGING (1 TO 3) 2
WHAT PERCENT CONVERGENCE? (0.001-100.0) 99.0

ENTER MAXIMUM NUMBER OF ITERATIONS TO BE PERFORMED
(-1 TO PERFORM AS MANY AS NEEDED TO ATTAIN DESIRED CONVERGENCE)
#-1

PERCENT CONVERGENCE= 0.00
PERCENT CONVERGENCE= 86.95
PERCENT CONVERGENCE= 94.81
PERCENT CONVERGENCE= 98.55
PERCENT CONVERGENCE= 99.23

5 ITERATION(S).

NUMBER OF POINTS IN EACH CLUSTER:
2990 2959 2008

CATEGORIES 1 AND 2 ARE MERGED. DISTANCE 0.58 < DELTA.
PERCENT CONVERGENCE= 36.66
PERCENT CONVERGENCE= 97.45
PERCENT CONVERGENCE= 99.01

8 ITERATION(S).

NUMBER OF POINTS IN EACH CLUSTER:
4097 3860

FINAL CLASSIFICATION

NUMBER OF POINTS IN EACH CLUSTER:
4097 3860
TO SEE CLASSIFICATION, CREATE A CATEGORIZED WINDOW
FILE AND USE THE "PRINT" COMMAND.
WANT TO SEE STATISTICS? (Y OR N) Y

SEPARABILITY MATRIX

1 + 1.00
2 + 0.93 1.00
+ + +
1 2

GROUP	MEANS				VARIANCES			
1	17.23	19.06	36.14	17.55	89.15	67.32	45.28	68.32
2	17.97	18.66	44.56	22.52	82.98	62.59	80.94	51.79

CREATE A CATEGORIZED WINDOW FILE? (Y OR N) N

CREATE A STATISTICS FILE? (Y OR N) Y

OUTPUT STATISTICS FILE=E12-STAT.-CORN/2-GPS

2!

FILE TRANSFER BETWEEN HOSTS

(
@FTP
*CONNECT (to) HOST NAME OR OCTAL NUMBER I4
 Connection opened.
 Assuming 36-bit connections, Paged transfers.
*LOGIN(user-ident) AMESIO (password) (account #)
*TYPE I
*SEND (local-file) E12-PACK.-SBEANS
 to remote-file E12-PACK.-SBEANS
< Store of <AMESIO>E12-PACK.-SBEANS;1;P777752;A14, Image type, started
< Transfer completed.
*DISCONNECT
*QUIT
@

CONNECTION TO <AMESIO>

@TELNET

#CONNECTION.to I4 is complete

I4-TENEX

(
@LOGIN ERTS (password)

IAC ACL-EXEC 2.2.8 (1-31-77) date & time

!ERTS

I4-TENEX

@CONNECT AMESIO (password)
@<AMESPNW>EDITOR

 to do EDITOR at I4

 :
 :
 :

@QUIT (quit ERTS)
!LOGOUT (quit I4)
ctrl-Z
#QUIT (quit TELNET)
@

SUBMITTING AN ILLIAC JOB

@<RAY>EDITOR
!ANALYZE LANDSAT IMAGERY
2!EXECUTE ANALYSIS ON ILLIAC IV
ENTER USER CODE AT I4: AMESIO
ENTER PASSWORD AT I4:
ENTER ACCOUNT NUMBER AT I4:
#CLUSTER A WINDOW
NUMBER OF CHANNELS IN DATA=4
ENTER NAME(S) OF INPUT WINDOW FILE(S)
INPUT FILE FILE=E12-PACK.-SBEANS
INPUT WINDOW FILE=E12-PACK.-CORN
INPUT WINDOW FILE=
USE INPUT STATISTICS FILE(S) (FOR INITIAL MODE CENTERS)? (Y OR N) N
ARE THE INPUT WINDOW FILE(S) AT ILLIAC? (Y OR N) N

ILLIAC IV JOB NUMBER=364
FILE TRANSMISSION TO ILLIAC IV IN PROGRESS, WAIT.....
ILLIAC I4 JOB SUCCESSFULLY SUBMITTED
#

CHECKING PROGRESS OF ILLIAC JOB

#INQUIRE
ILLIAC IV JOB NUMBER=364
ILLIAC IV JOB COMPLETED
RETRIEVE CLUSTERED WINDOW FILE(S)? (Y OR N) Y
ENTER NUMBER OF INPUT WINDOW FILES USED FOR THIS CLUSTER: 2

YOUR LOCAL FILE NAMES WILL BE CL36400.OUT, ..., CL36401.OUT
RETRIEVE OUTPUT STATISTICS FILE(S)? (Y OR N) Y

YOUR LOCAL FILE NAMES WILL BE CL36400.CF, ..., CL36401.CF
FILE TRANSMISSION FROM ILLIAC IV IN PROGRESS, WAIT.....
PROGRAM IS:
<ERTS>CLUSTR.LNKD TIME (SECONDS)=5 TRO=902A
INPUT FILES=
CL36400.IN TO I4DM:WIND00
CL36401.IN TO I4DM:WIND01
OUTPUT FILES=
I4DM:WINX00 TO CL36400.OUT
I4DM:COFF00 TO CL36400.CF
I4DM:WINX01 TO CL36401.OUT
I4DM:COFF01 TO CL36401.CF

CLUSTER, 4 CHANNEL TIME=5 (SECONDS)
GOOD COMPLETION NUMBER OF ITERATIONS=67

INPUT WINDOW FILE(S):
CL36400.IN
CL36401.IN

INPUT STATISTICS FILE(S):
(NONE USED)
OUTPUT (CATEGORIZED) WINDOW FILE(S):
CL36400.OUT
CL36401.OUT
OUTPUT STATISTICS FILE(S):
CL36400.CF
CL36401.CF

DELETE INPUT FILES FOR THIS RUN AT I4? (Y OR N) Y
ATTEMPTING TO DELETE FILE CL36400.IN
CL36400.IN;1 DELETED

!
ATTEMPTING TO DELETE FILE CL36401.IN
CL36401.IN;1 DELETED

!
DELETE OUTPUT FILES FOR THIS RUN AT I4? (Y OR N) Y
ATTEMPTING TO DELETE FILE CL36400.OUT
CL36400.OUT;1 DELETED

!
ATTEMPTING TO DELETE FILE CL36400.CF
CL36400.CF;1 DELETED

!
ATTEMPTING TO DELERE FILE CL36401.OUT
CL36401.OUT;1 DELETED

!
ATTEMPTING TO DELETE FILE CL36401.CF
CL36401.CF;1 DELETED

!
DELETE POF FOR THIS RUN AT I4 (Y OR N)? Y
ATTEMPTING TO DELETE FILE CLU364.POF
CLU364.POF;1 DELETED

!

#

Note: five additional files are created in the user's directory
as a result of the above dialogue:

364.PIF	JCL for ILLIAC; created by 'CLUSTER A WINDOW' command.
364.FTPSOURCE	A file of FTP commands to transfer files from user's directory into AMESIO directory; created by 'CLUSTER A WINDOW' command.
364.FTPRESP	The FTP response or dialogue; created by 'CLUSTER A WINDOW' command.
364.FTPSOURCE	A file of FTP commands to transfer files from AMESIO directory into user's directory; created by 'INQUIRE' command.
364.FTPRESP	The FTP response or dialogue; created by 'INQUIRE' command.

GROUP CATEGORIES AUTOMATICALLY

@<RAY>EDITOR>
!ANALYZE LANDSAT IMAGERY
2!GROUP CATEGORIES AUTOMATICALLY

ENTER PRINT DEVICE:
T=>TERMINAL OR B=>BACKUP DISK T

ENTER "S" TO GROUP WITH SPECTRAL STATISTICS
ENTER "A" TO GROUP WITH ADJACENCIES
#S

ENTER NAME OF INPUT STATISTICS FILE
INPUT STATISTICS FILE=E12-STAT.-CORN/15-GPS
NUMBER OF CATEGORIES= 15 NUMBER OF CHANNELS=4
ENTER "E" FOR EQUAL WEIGHTS OF "D" FOR DISTRIBUTION WEIGHTS E

MINIMUM-RELATIONAL-TRANSMISSION-LOSS
HEIRARCHICAL CLUSTER ANALYSIS PROCEDURE:
"CLUSTERS" = 15

CLUSTER ANALYSIS COMPLETED.

CLUSTER MERGING TREE NUMBER OF CLUSTERS IS 15

CHAR 123456879ACBDEF

TENS 000000000111111
UNIT 123456879021345
0 123456879ACBDEF
000000000111111
123456879021345
| | | | | | | | | *+ | | | | |
1 123456879ACBDEF
0000000001 1111
1234568790 1345
| | | | | *+ | | | | | | | | |
2 123456879ACBDEF
000000 001 1111
123456 790 1345
| | | *+ | | | | | | | | |
3 123456879ACBDEF
0000 0 001 1111
1234 6 790 1345
| | | | | | | | *+ | | | | |
4 123456879ACBDEF
0000 0 001 111
1234 6 790 345
| | | | | *+ | | | | | | | | |
5 123456879ACBDEF
0000 0 0 1 111
1234 6 7 0 345
| *+ | | | | | | | | |

6 123456879ACBDEF
 00 0 0 0 1 111
 12 4 6 7 0 345
 || | | | | *+|

7 123456879ACBDEF
 00 0 0 0 1 1 1
 12 4 6 7 0 3 5
 || | *+ | | | |

8 123456879ACBDEF
 00 0 0 1 1 1
 12 4 6 0 3 5
 | *+ | | | |

9 123456879ACBDEF
 00 0 1 1 1
 12 6 0 3 5
 || | *--+ |

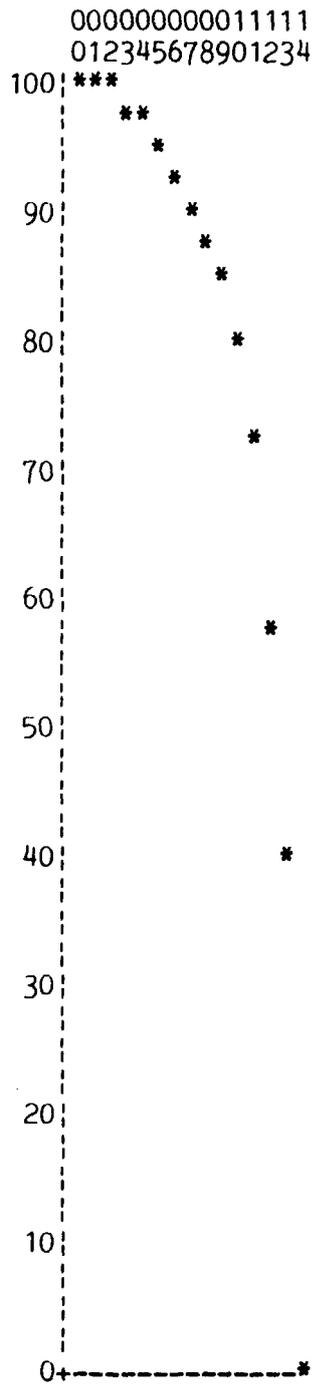
10 123456879ACBDEF
 00 0 1 1
 12 6 0 5
 *+ | | | |

11 123456879ACBDEF
 0 0 1 1
 1 6 0 5
 *-----+ | | | |

12 123456879ACBDEF
 0 1 1
 1 0 5
 | | *-----+

13 123456879ACBDEF
 0 1
 1 0
 *-----+

NUMBER OF STAGE OF PAIRWISE CLUSTER MERGING



111111000000000
543210987654321
NUMBER OF CLUSTERS REMAINING AT EACH STAGE

PATTERN TRANSMISSION LOSS FUNCTION FOR CLUSTER ANALYSIS

(PERCENT PATTERN TRANSMISSION RETAINED)
DO YOU WISH TO CONTINUE (Y OR N)? N
2!

STATISTICS FILE EDITOR

@<RAY>EDITOR
!ANALYZE LANDSAT IMAGERY
2!ENTER STATISTICS FILE EDITOR

INPUT STATISTICS FILE=E12-STAT.80-GPS

NUMBER OF CATEGORIES=80 NUMBER OF CHANNELS=4

TYPE "?" FOR LIST OF COMMANDS

#P

ENTER LIST OF CATEGORIES TO BE POOLED:2,4,6,7,9

INPUT CATEGORIES 2(2) 4(4) 6(6) 7(7) 9(9)
POOLED TO OUTPUT CATEGORY 1(1)

#P

ENTER LIST OF CATEGORIES TO BE POOLED:3,5,8,10,11,12,13

INPUT CATEGORIES 3(3) 5(5) 8(8) A(10) B(11) C(12) D(13)
POOLED TO OUTPUT CATEGORY 2(2)

#W

LOW CATEGORY, HIGH CATEGORY=1,1

INPUT CATEGORY 1(1) TO OUTPUT CATEGORY 3(3)

.
.
.

#R

ENTER LIST OF OUTPUT CATEGORIES:1,4

ENTER NAMES TO USE FOR THESE CATEGORIES
:WASTELAND

:

#R

ENTER LIST OUTPUT CATEGORIES:5,7

ENTER NAMES TO USE FOR THESE CATEGORIES
:SOYBEANS

:

.
.
.

#F

NAMES OF INPUT CATEGORIES

- 1: WASTELAND
- 2: WASTELAND
- 3: WASTELAND
- 4: WASTELAND
- 5: SOYBEANS
- 6: SOYBEANS
- 7: SOYBEANS
- .
- .
- .

#G

OUTPUT STATISTICS FILE=E12-STAT.19-GPS/EP

DO YOU WISH TO CONTINUE (Y OR N)Y

INPUT STATISTICS FILE=E12-STAT.19-GPS/EP

NUMBER OF CATEGORIES=19 NUMBER OF CHANNELS=4

#M

MEANS:

CAT#	CHANNELS			
	1	2	3	4
1	16.88	16.20	46.89	24.56
2	22.45	23.97	41.71	18.86
.				
.				
.				
J	14.32	12.72	46.72	26.19

#N

CAT# 1 2 3 ...
 # POINTS 758 526 8 ...
 TOTAL NUMBER OF POINTS= 18043

#S

SEPARABILITY MATRIX:

CAT#	1	2	3 ...
1	1.00	0.61	2.23 ...
2		1.00	1.68 ...
3			1.00 ...
.			
.			
.			

#Z

VARIANCE-COVARIANCE MATRIX, (UPPER TRIANGULAR):

CAT#	CHANNELS			
	1	2	3	4
1	4.76	5.38	6.33	1.89
		8.52	7.89	2.26
			24.20	10.74
				6.55

.
.
.

#I

LOW CATEGORY, HIGH CATEGORY=1,19

INPUT CATEGORY 1(1) INVERTED TO OUTPUT CATEGORY 1(1)

INPUT CATEGORY 2(2) INVERTED TO OUTPUT CATEGORY 2(2)

.
.
.

INPUT CATEGORY J(19) INVERTED TO OUTPUT CATEGORY J(19)

#A

DO YOU WANT TO USE AN INPUT FILE OF APRIORI PROBABILITIES? (Y OR N):N

ENTER NUMBER OF CATEGORIES FOR APROIRI PROBABILITIES:19

ENTER APRIORI PROBABILITIES FOR CATEGORIES IN ORDER AS GIVEN

CATEGORY PROBABILITY

1	<u>.02</u>
2	<u>.03</u>
3	<u>.007</u>

.
.
.

J	<u>.08</u>
---	------------

SAVE THE PROBABILITIES IN A FILE? (Y OR N) Y

ENTER NAME OF OUTPUT APRIORI FILE

OUTPUT APRIORI PROB FILE=E12-PRIORS.19-GPS/PER

#G

OUTPUT STATISTICS FILE=E12-ISTAT.19-GPS/PER

DO YOU WISH TO CONTINUE (Y OR N)Y

INPUT STATISTICS FILE=E12-ISTAT.19-GPS/PER

NUMBER OF CATEGORIES=19 NUMBER OF CHANNELS=4

#L

CAT#	B-VALUE	PROBABILITY
1	-5.78	0.020
2	-6.26	0.030
3	-6.18	0.007
.		
.		
.		
J	-8.11	0.080

#Q

2!

GENERATE CONCENTRATION ELLIPSE PLOTS

@<RAY>EDITOR
!ANALYZE LANDSAT IMAGERY
2!GENERATE CONCENTRATION ELLIPSE PLOTS

ENTER PLOTTER TYPE (CAC,USDA):

*USDA

ENTER PERCENT OF DISTRIBUTION (50.0 - 99.9): 90.0

PLOT STAT FILE INFO BELOW PLOTS? (Y OR N) Y

Plotter output file is E12.PLOT

ENTER 2 BAND NUMBERS (4 TO 7): 5,7

ENTER TITLE (1-50 CHARS): E12: ALL COVERS - SEPTEMBER 7, 1975

Statistics input file is E12-STAT.20-GPS/EP

NUMBER OF CATEGORIES = 20

ENTER RANGE OF CATEGORIES (LOW,HIGH): 1,20

ANOTHER STATISTICS FILE (SAME PLOT)? (Y OR N) N

ANOTHER PLOT? (Y OR N) Y

USE PRESENTLY OPENED STAT FILE? (Y OR N) Y

ENTER 2 BAND NUMBERS (4 TO 7): 5,7

ENTER TITLE (1-50 CHARS): E12: CORN & SOYBEANS - SEPTEMBER 7, 1975

NUMBER OF CATEGORIES = 20

ENTER RANGE OF CATEGORIES (LOW,HIGH): 4,6

MORE CATEGORIES (SAME STAT FILE)? (Y OR N) Y

ENTER RANGE OF CATEGORIES (LOW,HIGH): 11,13

MORE CATEGORIES (SAME STAT FILE)? (Y OR N) N

ANOTHER PLOT? (Y OR N) Y

USE PRESENTLY OPENED STAT FILE? (Y OR N) Y

One plot page filled...open new plotter output file

Plotter output file is E12.PLOT;2 [New version]

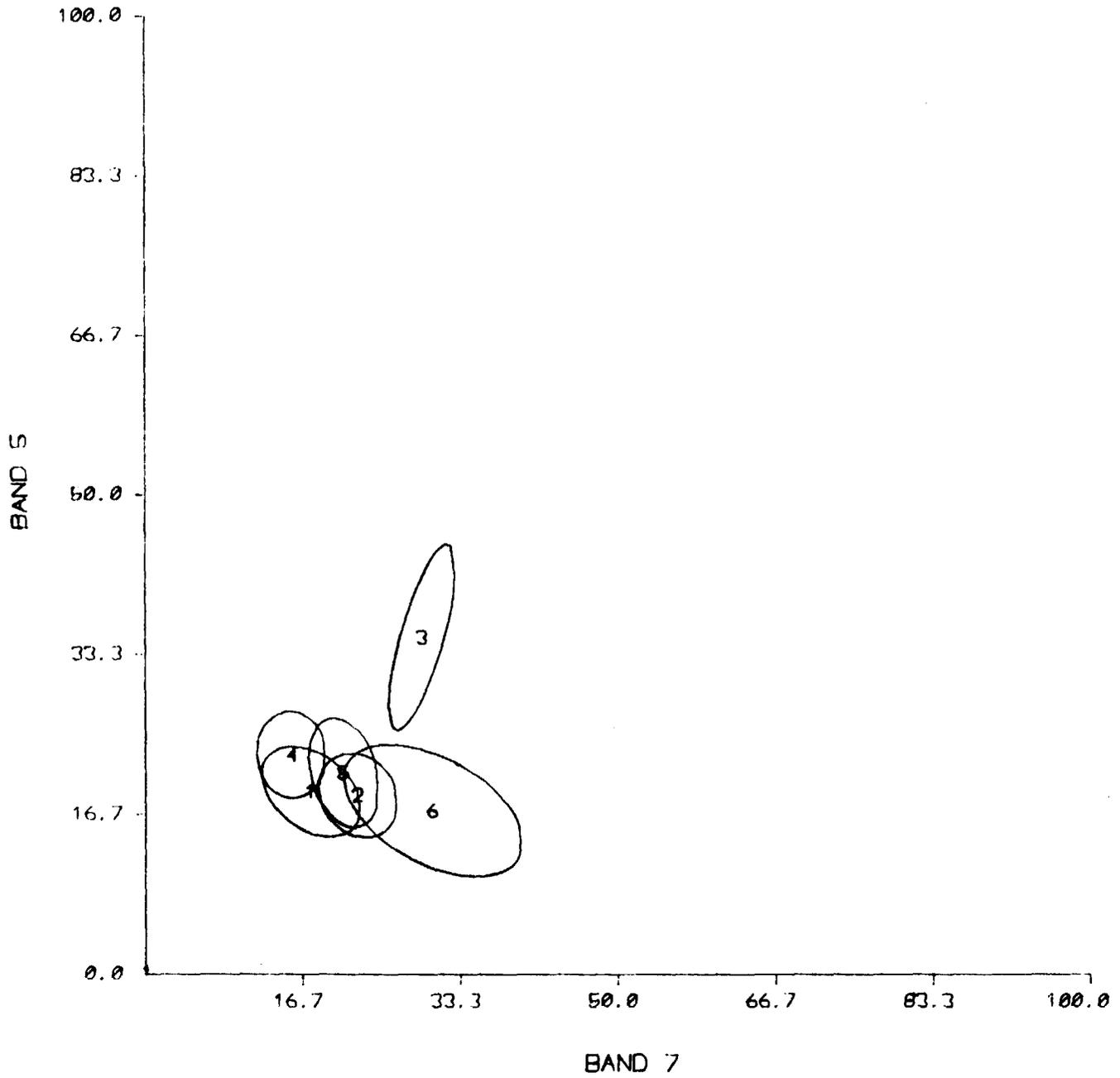
ENTER 2 BAND NUMBERS (4 TO 7): 5,7

.
.
.

ANOTHER PLOT? (Y OR N) N

2!

90.0% CONCENTRATION ELLIPSES FOR BANDS 7 AND 5
E12: CORN & SOYBEANS - SEPTEMBER 7, 1975



CLASSIFY A WINDOW

@<RAY>EDITOR
!ANALYZE LANDSAT IMAGERY
2!CLASSIFY A WINDOW
NUMBER OF CHANNELS=4
CHOOSE TYPE OF CLASSIFICATION:GAUSSIAN MAXIMUM LIKELIHOOD CLASSIFICATION

INPUT STATISTICS FILE=E12-STAT.19-GPS/EP
FILE TYPE=4, CATEGORIES OUTPUT=19, CHANNELS=4

INPUT WINDOW FILE=E12-PACK.NB

FILE TYPE=0, ROW COL SAMPLING= 1 1, CHANNELS=4
NUMBER OF WINDOWS= 1

CATEGORIZED WINDOW FILE=E12-CLASS.19-GPS/EP

500 POINTS CLASSIFIED

1000 POINTS CLASSIFIED

·
·
·

29500 POINTS CLASSIFIED

29918 TOTAL POINTS CLASSIFIED
2!

COUNT CATEGORIZED PIXELS

@<RAY>EDITOR

!ANALYZE LANDSAT IMAGERY

2!COUNT CATEGORIZED PIXELS

INPUT CATEGORIZED WINDOW FILE=E12-CLASS.20-GPS/PER

ROW SAMPLE=1 COLUMN SAMPLE=1

NUMBER OF WINDOWS=1

WINDOWS ARE:(NW,SE;# POINTS)

1:1,1,1,29918; 29918

TOTALS FOR CATEGORIZED FILE

CATEGORY :	1:	2:	. . .	TOTAL:
# POINTS:	3188:	1457:	. . .	29918:
% OF TOTAL:	10.66%:	4.87%:	. . .	100.00%:

2!

UNPACK A PACKED FILE

@<RAY>EDITOR

!USE GROUND DATA EDITING SYSTEMS

?!SELECT FIELDS TO EXTRACT

ENTER FRAME NAMES ONE PER LINE (TERMINATE WITH CARRIAGE RETURN ONLY)

:2228-15515

:2228-15522

:

#DIRECTORIES (SELECT OTHER DIRECTORIES TO TRY)

ENTER DIRECTORIES

:USDA-SRS

:USDA-SD

:

#UNPACK A FILE

INPUT WINDOW FILE=E12-CLASS.20-GPS/PER

WINDOW TYPE=3

WINDOW FROM WINDOW FILE=1,1,1,29918

OUTPUT WINDOW FILE=E12-CLASS/UNP.20-GPS/PER

(SEGMENT #, MASK GROUND TRUTH, DATE:USER OR MASK, NUMBER OF PARTS)

(5009, MG, 7-Sep-75:M, 1) (5010, MG, 7-Sep-75:M, 1)

.

.

.

#

TABULATE THRESHOLDED PIXELS

```
@<RAY>EDITOR
!ANALYZE LANDSAT IMAGERY
2!TABULATE THRESHOLDED PIXELS
INPUT CLASSIFIED WINDOW FILE=E12-CLASS.20-GPS/PER
ROW SAMPLE=1 COLUMN SAMPLE=1
NUMBER OF WINDOWS=1
WINDOWS ARE:
1,1,1,29918
NUMBER OF POINTS=29918
```

```
ENTER 'T' TO SEE ORDINARY TABLE OF THRESHOLDS
ENTER 'C' TO SEE CUMULATIVE TABLE
ENTER 'B' TO SEE BOTH: B
```

TABLE OF THRESHOLD VALUES AND CATEGORIES

```
CHI-SQUARE VALUES
CAT : .999: .995: .990: . . . .010: .000: TOTAL:
1: 0: 0: 3: . . . 67: 39: 3118:
2: 3: 5: 6: . . . 30: 25: 1457:
.
.
.
K: 0: 0: 0: . . . 0: 0: 7:
TOTAL: 6951: 3545: 3859: . . . 394: 319: 29918:
```

CUMULATIVE TABLE OF THRESHOLD VALUES AND CATEGORIES
EACH ENTRY IS THE SUM OF THE ENTRY AT THE LEVEL SHOWN
AND ENTRIES AT ALL LOWER LEVELS

```
CHI-SQUARE VALUES
CAT : .999: .995: .990: . . . .010: .000:
1: 3188: 3188: 3188: . . . 106: 39:
2: 772: 558: 421: . . . 55: 25:
.
.
.
K: 7: 7: 7: . . . 0: 0:
TOTAL: 29918: 29875: 29820: . . . 713: 319:
```

2!

TABULATE A CLASSIFIED FILE

@<RAY>EDITOR

!USE GROUND DATA EDITING SYSTEMS

2!SELECT FIELDS TO EXTRACT

ENTER FRAME NAMES ONE PER LINE (TERMINATE WITH CARRIAGE RETURN ONLY)

:2228-15515

:2228-15522

:

#DIRECTORIES (SELECT OTHER DIRECTORIES TO TRY)

:USDA-SRS

:USDA-SD

:

#TABULATE

INPUT WINDOW FILE=E12-CLASS.20-GPS/EP;1 [Old version]

WINDOW TYPE=3

WINDOW FROM WINDOW FILE=1,1,1,29918

TABULATE BY:

*SEGMENT

MINIMUM RELIABILITY TO TABULATE (0.0 TO 1.0) 0.0

SAVE TABLE RESULTS IN A FILE? (Y OR N) Y

OUTPUT TABLE FILE=E12-TAB.20-GPS/EP

DISPLAY THE TABLE (Y OR N)? N

(SEGMENT #, MASK GROUND TRUTH, DATE:USER OR MASK, NUMBER OF PARTS)

(5009, MG, 7-Sep-75:M, 1) (5010, MG, 7-Sep-75:M, 1)

.

.

.

#

DETERMINE PERCENT CORRECT

@<RAY>EDITOR
!ANALYZE LANDSAT IMAGERY
2!DETERMINE PERCENT CORRECT

INPUT TABLE FILE=E12-TAB.20-GPS/EP

COVER=UNKNOWN
ENTER CATEGORIES:

COVER ALFALFA
ENTER CATEGORIES:7,8,9,10

COVER CORN
ENTER CATEGORIES:11,12,13

.
.
.

CATEGORIZED TO:
FROM:

	: ALFALFA:	CORN:	WASTE LAND:	. . .	: TOTAL:
ALFALFA:	203:	117:	73:		: 667:
CORN:	978:	6573:	665:		: 12074:
WASTE LAND:	400:	724:	1033:		: 3336:

.
.
.

TOTAL: 4014: 8950: 2383: :27669:

OVERALL PERCENT CORRECT= 49.02%

ENTER "S" TO SEE PERCENT CORRECT BY SEGMENT OR "Q" TO QUIT: Q

2!

REVISE OR LIST A FRAME UNIT FILE

@<RAY>EDITOR

!USE GROUND DATA EDITING SYSTEMS
2!REVISE OR LIST A FRAME UNIT FILE

*?

COMMANDS ARE
OPEN A FRAME UNIT FILE
CREATE A FRAME UNIT FILE
QUIT
?

*OPEN A FRAME UNIT FILE
STATE=ILLINOIS

#?

COMMANDS ARE
UPDATE
EDIT STRATA FACTOR ENTRIES
DELETE A COUNTY
LIST
QUIT
?

#LIST
LISTING BY:COUNTY (also 'ALL')
COUNTY=ADAMS

COUNTY=ADAMS
11(232) 12(269) 20(301) 31(92) 32(66) 33(11) 40(13)
stratum(# of frame units)

Note: if 'ALL' was selected, the following table also appears:

STRATA	FACTOR
11	1
12	1
20	1
31	.25
32	.1
33	.25
40	2
61	.5

#QUIT
2!

TESTING COUNTIES FOR COMPLETE CONTAINMENT IN A SCENE

1. Generate mask file for the county in question (see 'GENERATE MASK FILE').
2. Retrieve from tape the unpacked window for the county (see 'RETRIEVE WINDOW FROM TAPE'). If the mask window coordinates were not saved in a file, then input the coordinates from the terminal using the 2!-level command 'INSERT COORDINATES'. Put the unpacked window into a file named in the form:

9---.WIN/SCENE # ,e.g. 9097.WIN/2228-15515
3. Pack the county window (see 'PACK A FILE'). Use region 'SEG 9---#' and options 'NOT BACKGROUND#'. In response to '9---.GTRUTH NOT FOUND', 'SELECT A COURSE OF ACTION', use 'PROCEED AND IGNORE MISSING FILE'.
4. Use <OZGA>CHECKP on the packed file created in step 3 to determine the total number of pixels in the county and the total number of pixels with 255 in all channels. The number of pixels with 255 in all channels divided by the total number pixels is the proportion of the county outside the scene.

```
@<OZGA>CHECKP  
INPUT WINDOW FILE=E1-PACK.9097
```

```
TYPE=0 NUMBER OF CHANNELS=4  
WINDOW=1,1,6,44587 NUMBER OF POINTS=267522  
4096 PIXELS PROCESSED  
8192 PIXELS PROCESSED
```

```
.  
. .  
. .
```

```
266240 PIXELS PROCESSED  
267522 PIXELS PROCESSED
```

```
1508 PIXELS WITH 255 IN ALL CHANNELS FOUND
```

```
@
```

ESTIMATE ACREAGE: DIRECT EXPANSION ESTIMATE

@<RAY>EDITOR
!ANALYZE LANDSAT IMAGERY
2!ESTIMATE ACREAGE

#DIRECTORIES (SELECT OTHER DIRECTORIES TO TRY)

ENTER DIRECTORIES

:USDA-SRS
:USDA-SD
:

#SAMPLE ESTIMATION

ENTER FRAME NAMES ONE PER LINE (TERMINATE WITH A CARRIAGE RETURN ONLY)

:2228-15515
:2228-15522
:

STATE=ILLINOIS

SELECT REGION

*FRAME (2228-15515,2228-15522)#
ACCEPTED SELECTION

COUNTIES IN REGION SELECTED

CHAMPAIGN COOK DEWITT DOUGLAS DUPAGE EDGAR FORD IROQUOIS
KANKAKEE KENDALL LAKE LIVINGSTON MCHENRY MCLEAN VERMILION
WILL

ENTER ADDITIONAL COUNTIES:

:PIATT
:

SELECT OPTIONS

*COVER CORN#
ACCEPTED SELECTION

(SEGMENT #, MASK GROUND TRUTH, DATE: USER OR MASK, NUMBER OR PARTS)

(5009, MG, 7-Sep-75: M, 1) (5010, MG, 7-Sep-75: M, 1)

.
.
.

COVERS OCCURRING IN OPTIONS SELECTED

CORN

SELECT TYPE OF ESTIMATOR
#DIRECT EXPANSION

SELECT VARIABLE TO BE EXPANDED
#REPORTED ACREAGE

STRATA	# SEGMENTS	FRAME UNITS	VARIABLE
11	42	8486.0	12324.5
12	4	918.0	625.5
20	2	279.0	292.1
31	8	4312.0	145.5
.			
.			
.			

FRAME UNITS AND VARIABLE(S) IN ABOVE TABLE ARE NOT ADJUSTED
BY STRATA FACTORS
AUTOMATICALLY DELETE STRATA WITH FEWER THAN 5 SEGMENTS (Y OR N)? N

DO YOU WISH TO DELETE ANY STRATA? (Y OR N) N

YOU MUST POOL STRATA SINCE SOME STRATA HAVE LESS THAN 2 SEGMENTS

ENTER POOLING
*30+31, 32, 33, 40, 61
*

POOLING IS:

OLD	NEW
11	11
12	12
20	20
31	30
32	30
33	30
40	30
61	30

POOLING OK (Y OR N)? Y

STRATA	# SEGMENTS	FRAME UNITS	VARIABLE
11	64	8486.0	12324.5
12	4	918.0	625.5
20	2	279.0	292.1
30	16	2028.4	582.0

POOLED STRATA:STRATA(FACTOR)...
 11:11(1)
 12:12(1)
 20:20(1)
 30:31(.25) 32(.1) 33(.25) 40(2) 61(.5)

MAKE A FILE OF SEGMENT TOTALS (Y OR N)? N

DIRECT EXPANSION ESTIMATOR
 VARIABLE BEING EXPANDED =REPORTED ACREAGE

STRATA	EXPANDED ACRES	STANDARD DEVIATION	C.V.
		(STRATUM TOTAL)	
11	2490135.88	99243.18	3.99%
12	143552.25	31502.41	21.94%
20	40747.95	2932.88	7.20%
30	73783.05	46594.89	63.15%
TOTALS	2748219.13	114110.89	4.51%

#?
 COMMANDS ARE
 TYPE OF ESTIMATION (LARGE OR SAMPLE)
 ESTIMATOR (NEW ESTIMATOR, SAME OPTIONS AND REGION)
 TABLE (NEW ESTIMATOR AND NEW TABLE FILE FOR NEXT USE OF PIXELS)
 OPTIONS (SELECT NEW OPTIONS, SAME REGION)
 REGION (SELECT NEW REGION)
 QUIT

#OPTIONS (SELECT NEW OPTIONS, SAME REGION)

return to 'SELECT OPTIONS' prompt above

.
.
.

#QUIT
2!

ESTIMATE ACREAGE: REGRESSION ESTIMATE

@<RAY>EDITOR
!ANALYZE LANDSAT IMAGERY
2!ESTIMATE ACREAGE

#DIRECTORIES (SELECT OTHER DIRECTORIES TO TRY)

ENTER DIRECTORIES

:USDA-SRS

:USDA-SD

:

#SAMPLE ESTIMATION

ENTER FRAME NAMES ONE PER LINE (TERMINATE WITH A CARRIAGE RETURN ONLY)

:2228-15515

:2228-15522

:

STATE=ILLINOIS

SELECT REGION

*FRAME (2228-15515,2228-15522)#

ACCEPTED SELECTION

COUNTIES IN REGION SELECTED

CHAMPAIGN COOK DEWITT DOUGLAS DUPAGE EDGAR FORD IROQUOIS
KANKAKEE KENDALL LAKE LIVINGSTON MCHENRY MCLEAN VERMILION
WILL

ENTER ADDITIONAL COUNTIES:

:

SELECT OPTIONS

*-COVER CORN#

ACCEPTED SELECTION

(SEGMENT #, MASK GROUND TRUTH, DATE: USER OR MASK, NUMBER OR PARTS)

(5009, MG, 7-Sep-75: M, 1) (5010, MG, 7-Sep-75: M, 1)

.

:

.

COVERS OCCURRING IN OPTIONS SELECTED

CORN

SELECT TYPE OF ESTIMATOR
#REGRESSION

SELECT DEPENDENT VARIABLE(Y)
#REPORTED ACREAGE

SELECT INDEPENDENT VARIABLE(X)
#PIXELS

ENTER MULTIPLIER FOR PIXELS TO ACRES: 1

ENTER LIST OF CATEGORIES: 12,13,14

TABLE FILE=E12-TAB.19-GPS/EP

STRATA	# SEGMENTS	FRAME UNITS	INDEPENDENT(X)	DEPENDENT(Y)
11	42	8486.0	8354.0	12324.5
12	4	918.0	436.0	625.5
.				
.				
.				

FRAME UNITS AND VARIABLE(S) IN ABOVE TABLE ARE NOT ADJUSTED
BY STRATA FACTORS
AUTOMATICALLY DELETE STRATA WITH FEWER THAN 5 SEGMENTS (Y OR N)? N

DO YOU WISH TO DELETE ANY STRATA? (Y OR N) N

YOU MUST POOL STRATA SINCE SOME STRATA HAVE LESS THAN 3 SEGMENTS

ENTER POOLING
*0+11,12,20,31,32,33,40,61
*

POOLING IS:
OLD NEW
11 0
12 0
.
.
.

POOLING OK (Y OR N)? Y

STRATA # SEGMENTS FRAME UNITS INDEPENDENT(X) DEPENDENT(Y)
0 64 11711.4 10814.0 13824.1

POOLED STRATA:STRATA(FACTOR)...

0:11(1) 12(1) 20(1) 31(.25) 32(.1) 33(.25) 40(2) 61(.5)

DO YOU WANT TO TEST POOLED STRATA (Y OR N)? N

MAKE A FILE OF SEGMENT TOTALS (Y OR N)? Y

OUTPUT FILE OF SEGMENT TOTALS=E12/O/STOT.-CORN/19-GPS/EP

REGRESSION ESTIMATOR

DEPENDENT VARIABLE (Y) =REPORTED ACREAGE

INDEPENDENT VARIABLE (X) =PIXELS

STRATA	R-SQUARE	COEFFICIENTS		STANDARD DEVIATION (STRATUM TOTAL)	C.V. 6.46%
		B(0)	B(1)		
0	0.3366	54.2114	0.9575	163411.05	

THE RELATIVE EFFICIENCY FOR THIS ESTIMATOR WITH RESPECT TO
DIRECT EXPANSION IS 1.48

CREATE AN ESTIMATOR OUTPUT FILE (Y OR N)? Y

OUTPUT ESTIMATOR PARAMETER FILE=E12/O/EST.-CORN/19-GPS/EP

#OPTIONS (SELECT NEW OPTIONS, SAME REGION)

return to 'SELECT OPTIONS' prompt above

.
.
.

#QUIT

2!

PROCESS SEGMENT TOTAL FILES

@<RAY>EDITOR
 !ANALYZE LANDSAT IMAGERY
 2!PROCESS SEGMENT TOTAL FILES

THIS PROGRAM PERFORMS A LINEAR REGRESSION OF VARIABLE Y ON X.

NAME OF Y-VARIABLE = Reported acres Woods

NAME OF X-VARIABLE = Pixels Woods

ENTER Y-VARIABLE:
 *REPORTED ACRES

ENTER X-VARIABLE:
 *PIXELS

The segment total input file is E12/0/STOT.-DWOODS/20-GPS/PER

USE POOLED OR ORIGINAL STRATA? (P OR O) P

3!COMBINED STRATA

VARIABLE	N	MEAN	CORRECTED SUM OF SQUARES	VARIANCE	STANDARD DEVIATION	C.V.
Pixel	64	19.750	136185.99800	2161.68250	46.49390	2.354
Repor	64	32.731	478074.78900	7588.48871	87.11193	2.661
XY	64	4063.733	218706.59600			

THE REGRESSION EQUATION IS:

$$\text{Reported acres Woods} = 1.014 + (1.60594 * \text{Pixels Woods})$$

ANALYSIS OF VARIANCE TABLE FOR VARIABLE Reported acres Woods

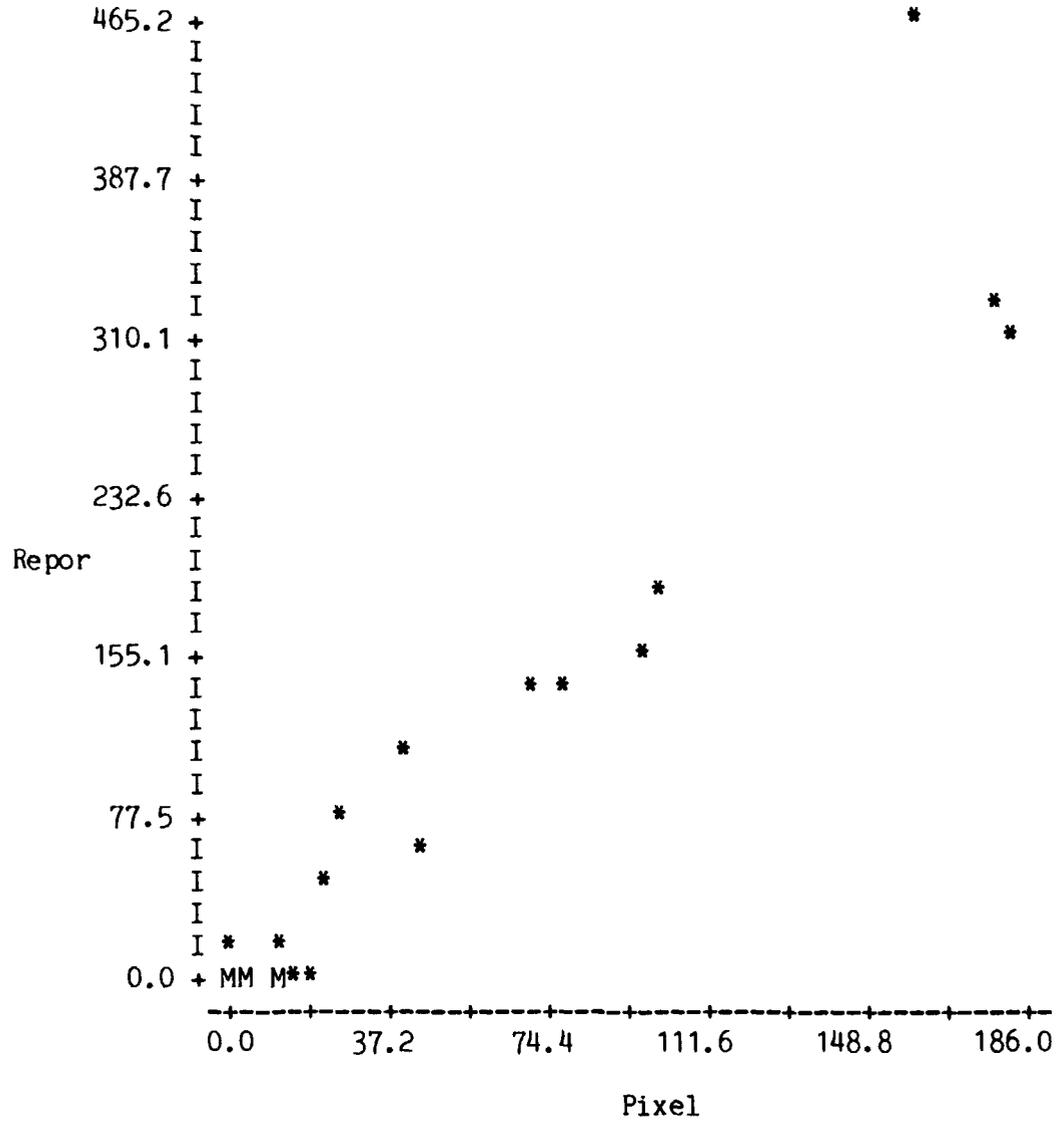
SOURCE OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN SQUARES	F-VALUE	P-VALUE
REGRESSION	1	351229.754000	351229.754000	171.6760	0.0000
RESIDUAL	62	126845.031000	2045.887600		

R = 0.857132 RSQUARE = .734675

#PLOT

*OBSERVATIONS

PLOT OF Reported acres Woods VS. Pixels Woods



#TABLE

SEGMENT	STRATUM		Pixel	Repor	ESTIMATE	RESIDUAL
	NEW	OLD				
5009	0	11	0.0	0.0	1.01	-1.01
5010	0	11	100.0	180.0	161.61	18.39
.						
.						
5281	0	32	10.0	0.0	17.07	-17.07
.						
.						
.						

#HYPOTHESIS TEST

THE FOLLOWING HYPOTHESES MAY BE TESTED:

1. $H_0: B_0=C$
2. $H_0: B_1=C$
3. $H_0: B_0=C_0, B_1=C_1$
4. $H_0: C_0*B_0 + C_1*B_1 =C$

ENTER NUMBER OF THE ABOVE HYPOTHESIS YOU WOULD LIKE TO TEST: 2

$H_0: B_1=C$. $C = \underline{1.114}$

T-VALUE	DF	P-VALUE
4.0136	62	.0002

*QUIT

#QUIT

3!QUIT

2!

ADD AGGREGATION FILES

@<RAY>EDITOR
!ANALYZE LANDSAT IMAGERY
2!ADD AGGREGATION FILES

INPUT AGGREGATION FILE (CARIAGE RETURN ONLY TO QUIT)=CL24300.AGG
INPUT AGGREGATION FILE (CARIAGE RETURN ONLY TO QUIT)=CL24600.AGG

.
.
.

INPUT AGGREGATION FILE (CARIAGE RETURN ONLY TO QUIT)=CL76100.AGG
INPUT AGGREGATION FILE (CARIAGE RETURN ONLY TO QUIT)=

OUTPUT COMBINED FILE=E12/12-COUNTIES/AGG.20-GPS/PER
2!

DISPLAY AN AGGREGATION FILE

@<RAY>EDITOR
!ANALYZE LANDSAT IMAGERY
2!DISPLAY AN AGGREGATION FILE

INPUT AGGREGATION FILE=E12/12-COUNTIES/AGG.20-GPS/PER

ENTER "P" FOR RESULTS IN PIXELS, "A" FOR ACRES, "H" FOR HECTARES: A

USE THE STANDARD MULTIPLIER OF 1.12 FOR PIXELS TO ACRES (Y OR N)? Y

MASK WINDOW= 1, 1, 1, 2820105 NUMBER OF POINTS= 2820105
NUMBER OF CATEGORIES=20 NUMBER OF FIELDS= 9

FIELD IDENTIFICATION:

FIELD 1: TRACT=A NUMBER= 1 (Stratum 11)

FIELD 2: TRACT=B NUMBER= 1 (Stratum 12)

.
.
.

FIELD 9: TRACT=I NUMBER= 1 (Stratum 61)

CURRENT GROUPING IS:

11111111112
12345678901234567890
123456789ABCDEFGHIJK

DO YOU WANT TO GROUP AND/OR ASSIGN NAMES (Y OR N)? N

CATEGORY				
FIELD:	1:	2: . . .	K:	TOTAL:
1:	58128:	511447: . . .	77030:	2087945:
2:	16355:	101097: . . .	24797:	469103:
.
.
.
9:	99:	296: . . .	48:	4347:
TOTAL:	81682:	647788: . . .	130838:	2817072:

VALUES IN TABLE ARE ACRES
BACKGROUND= 304862 PIXELS
OR 342445 ACRES

2!

LARGE SCALE ESTIMATION

@<RAY>EDITOR
!ANALYZE LANDSAT IMAGERY
2!ESTIMATE ACREAGE

#LARGE SCALE ESTIMATION

ESTIMATOR PARAMETER INPUT FILE=E12/10-25/EST.20-GPS/PER

DEPENDENT VARIABLE (Y) =REPORTED ACREAGE
INDEPENDENT VARIABLE (X) =PIXELS

STATE=ILLINOIS

COVERS OCCURING IN OPTIONS SELECTED

CORN

STRATA LIST POOLED INTO

11	10
12	10
20	25
31	25
32	25
33	25
40	25
61	25

POOLED STRATA:

10
25

COUNTIES IN REGION

CHAMPAIGN	COOK	DOUGLAS	DUPAGE	EDGAR	FORD	IROQUOIS
KANKAKEE	LAKE	PIATT	VERMILLION	WILL		

SELECT COUNTIES FOR LARGE SCALE ESTIMATION

#?

COMMANDS ARE

ALL COUNTIES AS IN SAMPLE ESTIMATOR PARAMETER FILE
SUBSET OF COUNTIES FROM SAMPLE ESTIMATOR PARAMETER FILE
?

#SUBSET OF COUNTIES FROM SAMPLE ESTIMATOR PARAMETER FILE

ENTER COUNTY NAMES (ONE PER LINE)

:CHAMPAIGN

:

FRAME UNITS IN POOLED STRATA FOR COUNTIES SELECTED

STRATA FRAME UNITS

10 266.0

25 6.8

POOLED STRATA:STRATA(FACTOR)...

10:11(1) 12(1)

25:20(1) 31(.25) 32(.1) 33(.25) 40(2) 61(.5)

INPUT AGGREGATION FILE=E12/10-25/AGG.20-GPS/PER

NUMBER OF CATEGORIES=20

SELECT TYPE OF ESTIMATOR

#REGRESSION

REGRESSION ESTIMATOR

DEPENDENT VARIABLE (Y) =REPORTED ACREAGE

INDEPENDENT VARIABLE (X) =PIXELS

ENTER "S" TO USE THE STANDARD ASSIGNMENT OF TRACT TO STRATA

OR "U" TO ENTER YOUR OWN STRATA ASSIGNMENT BY FIELD

#S

ENTER LIST OF CATEGORIES TO USE FROM AGGREGATION FILE: 11,12,13

STRATA	ESTIMATE	STANDARD DEVIATION	C.V.
10	76702.49	8954.63	11.7%
25	201.15	195.62	97.3%
TOTAL	76903.64	9557.31	12.4%

#?

COMMANDS ARE

TYPE OF ESTIMATION (LARGE OR SMALL)

ESTIMATOR (NEW ESTIMATOR, ALL ELSE THE SAME)

COUNTIES (SELECT NEW COUNTIES)

QUIT

#

BIBLIOGRAPHY

- [1] Thomas, John D., "An ILLIAC IV Algorithm for Cluster Analysis of ERTS-1 Imagery," CAC Technical Memo No. 17, Center for Advanced Computation, University of Illinois at Urbana-Champaign, Urbana, Illinois, May 1974.
- [2] Thomas, John D., "An ILLIAC IV Algorithm for Statistical Classification of ERTS-1 Imagery," CAC Technical Memo No. 18, Center for Advanced Computation, University of Illinois at Urbana-Champaign, Urbana, Illinois, May 1974.
- [3] Ray, Robert M., Thomas, John D., Donovan, Walter E., and Swain, Phillip H., "Implementation of ILLIAC IV Algorithms for Multispectral Image Interpretation, Final Report," CAC Document No. 112, Center for Advanced Computation, University of Illinois at Urbana-Champaign, Urbana, Illinois, June 1974.
- [4] Swain, Phillip H., "Implementation and Evaluation of ILLIAC IV Algorithms for Multispectral Image Processing," LARS Technical Memorandum T-16 111273, Laboratory for Applications of Remote Sensing, Purdue University, West Lafayette, Indiana, July 1974.
- [5] Donovan, Walter E., "Oblique Transformation of ERTS Images to Approximate North-South Orientation," CAC Technical Memo No. 38, Center for Advanced Computation, University of Illinois at Urbana-Champaign, Urbana, Illinois, November 1974.
- [6] Donovan, Walter E., Ozga, Martin, and Ray, Robert M., "Compilation and Geometric Registration of ERTS Multitemporal Imagery," CAC Technical Memo No. 52, Center for Advanced Computation, University of Illinois at Urbana-Champaign, Urbana, Illinois, May 1975.
- [7] Ray, Robert M., Ozga, Martin, Donovan, Walter E., Thomas, John D., and Graham, Marvin L., "EDITOR An Interactive Interface to ILLIAC IV - ARPA Network Multispectral Image Processing Systems," CAC Technical Memo No. 114, Center for Advanced Computation, University of Illinois at Urbana-Champaign, Urbana, Illinois, June 1975.
- [8] Donovan, Walter E., "Retrieval of LANDSAT Image Samples by Digitized Polygonal Windows and Associated Ground Data Information," CAC Technical Memorandum No. 57, Center for Advanced Computation, University of Illinois at Urbana-Champaign, Urbana, Illinois, August 1975.

- [9] Ozga, Martin, "Tape Archival Program for Agricultural Segment Data," CAC Technical Memo No. 73, Center for Advanced Computation, University of Illinois at Urbana-Champaign, Urbana, Illinois, May 1976.
- [10] Ozga, Martin, Donovan, Walter E., Ray, Robert M., Thomas, John D., and Graham, Marvin L., "Data File Formats for Processing of Multispectral Image Data," CAC Technical Memorandum No. 19, Center for Advanced Computation, University of Illinois at Urbana-Champaign Urbana, Illinois, October 1976 (revised).
- [11] Ozga, Martin, "Selection, Sampling, and Tabulation of Masked Fields in EDITOR," CAC Technical Memo No. 79, Center for Advanced Computation, University of Illinois at Urbana-Champaign, Urbana, Illinois, December 1976.
- [12] Gleason, C.P., Hanuschak, G.A., Starbuck, R.R., and Sigman, R.S., "Stratified Acreage Estimates in the Illinois Crop-Acreage Experiment," Forth Purdue Symposium on Machine Processing of Remotely Sensed Data, Purdue university, West Lafayette, Indiana, June 1977.
- [13] Ozga, Martin, Donovan, Walter E., and Gleason, Chapman P., "An Interactive System for Agricultural Acreage Estimates Using LANDSAT Data," Fourth Purdue Symposium on Machine Processing of Remotely Sensed Data, Purdue University, West Lafayette, Indiana, June 1977.

APPENDIX

Conventions for Naming Files Used in Analysis of 1975 Illinois Project

A. EDITOR file types used in analysis

<u>File Type</u>	<u>File Abbreviation</u>	<u>Description of File</u>
1. Sample fields file	FLDS	This file contains the set of fields sampled using the 'SAMPLE FIELDS' command. This file is used with the ctrl-B option of 'PACK A FILE' to extract the fields sampled.
2. Packed file	PACK	A file of raw LANDSAT pixels where the spatial relationships have been destroyed by 'Packing' all the pixels that satisfy 'SELECT REGION' and 'SELECT OPTIONS' into one file.
3. Unpacked file	UNP	A file of LANDSAT PIXELS (either raw or categorized) that has the spatial relationship of the file intact. These files are used for displaying with the 'PRINT A WINDOW' command.
4. Clustered file	CLUS	A raw window file or packed file which has been clustered. Note that a packed file which has been clustered must be unpacked before displaying with the 'PRINT A WINDOW' command.
5. Statistics or Inverted Statistics file	STAT ISTAT	This file contains the mean vectors and covariance matrices for the groups which were clustered using the 'CLUSTER A WINDOW' command or merged in the 'ENTER STATISTICS FILE EDITOR' command. The inverted statistics file contains the inverse of the covariance matrix (the ILLIAC IV Classify program will accept only inverted covariance matrices).
6. Classified file	CLASS	A raw window file or packed file which has been classified using a particular statistics file.

- | | | |
|------------------------|-------|--|
| 7. Priors file | PRIOR | This file, create by the statistics file editor, contains the prior probabilities for a group of categories corresponding to a statistics file. |
| 8. Tabulated file | TAB | A categorized (clustered or classified) file which has been summarized to the segment level for all groups in the categorization. Conceptually, this file has the crop/land use as rows and the category number as columns for each segment. |
| 9. Segment totals file | STOT | A file which is created by the 'ESTIMATE ACREAGE' command which has segment-level totals of digitized acreage, reported acreage, and pixels classified into a particular group or groups, as well as the segment number and stratum for each segment. This is an ASCII file. |
| 10. Estimator file | EST | This file contains the coefficients of a regression or ratio estimate to be used in estimating acreages for large areas. |

B. File naming convention

In general the form of a file name will be

SELECT REGION - FILE TYPE.options or other file input necessary to
describe the file uniquely

C. Some other conventions

1. A "/" separates the different options used to create a file. A "-" separates the particular option used in the creation of a file from the keyword identifying the option used, e.g. 7-GPS/PER

2. Priors:

EP = equal priors
 PER = proportional to expanded reported acres
 PED = proportional to expanded digitized acres
 PUR = proportional to unexpanded reported acres
 PUD = proportional to unexpanded digitized acres